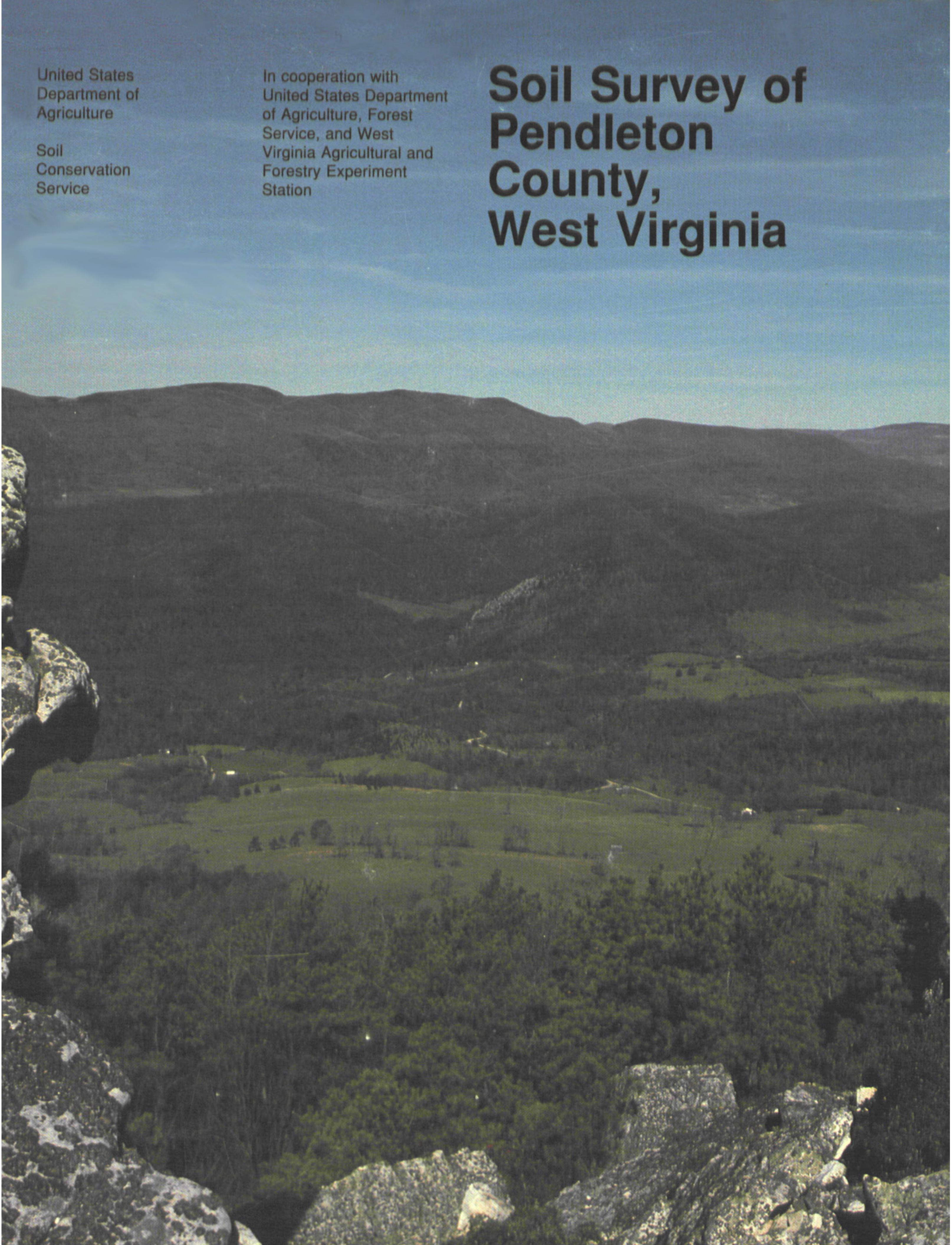
United States
Department of
Agriculture

Soil
Conservation
Service

In cooperation with
United States Department
of Agriculture, Forest
Service, and West
Virginia Agricultural and
Forestry Experiment
Station

Soil Survey of Pendleton County, West Virginia



How To Use This Soil Survey

General Soil Map

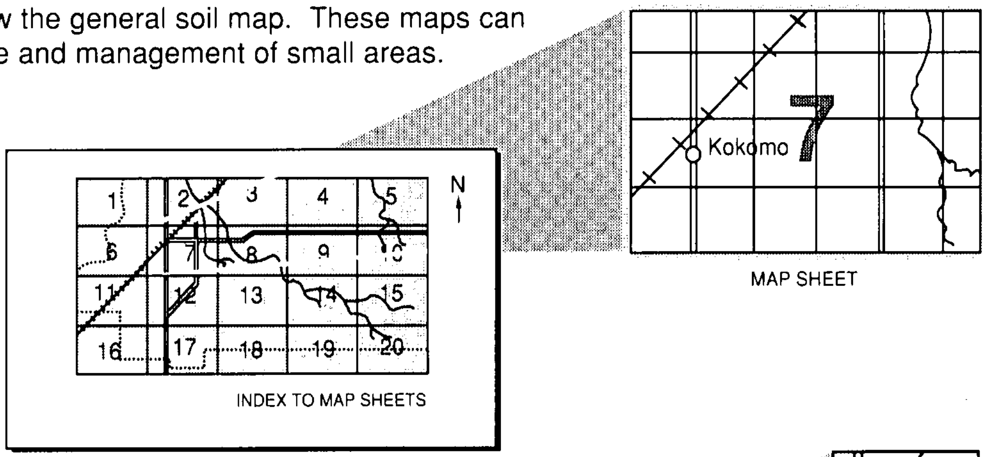
The general soil map, which is the color map preceding the detailed soil maps, shows the survey area divided into groups of associated soils called general soil map units. This map is useful in planning the use and management of large areas.

To find information about your area of interest, locate that area on the map, identify the name of the map unit in the area on the color-coded map legend, then refer to the section **General Soil Map Units** for a general description of the soils in your area.

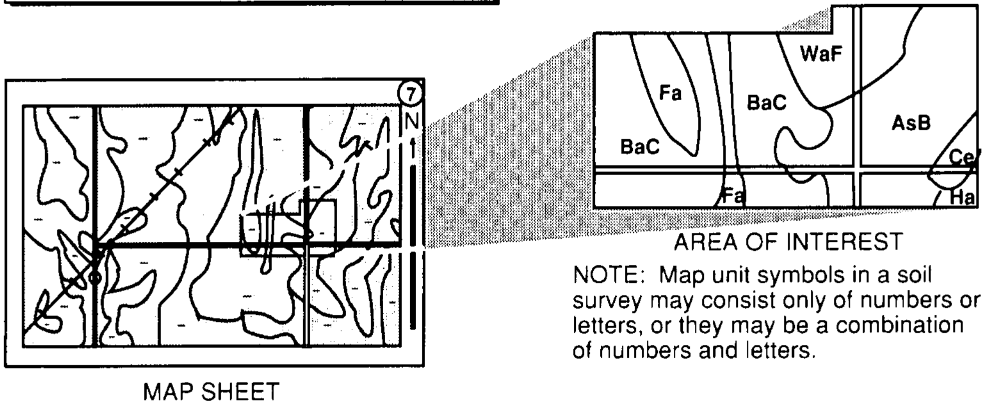
Detailed Soil Maps

The detailed soil maps follow the general soil map. These maps can be useful in planning the use and management of small areas.

To find information about your area of interest, locate that area on the **Index to Map Sheets**, which precedes the soil maps. Note the number of the map sheet, and turn to that sheet.



Locate your area of interest on the map sheet. Note the map unit symbols that are in that area. Turn to the **Index to Map Units** (see Contents), which lists the map units by symbol and name and shows the page where each map unit is described.



NOTE: Map unit symbols in a soil survey may consist only of numbers or letters, or they may be a combination of numbers and letters.

The **Summary of Tables** shows which table has data on a specific land use for each detailed soil map unit. See **Contents** for sections of this publication that may address your specific needs.

This soil survey is a publication of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other federal agencies, state agencies including the Agricultural Experiment Stations, and local agencies. The Soil Conservation Service has leadership for the federal part of the National Cooperative Soil Survey. In line with Department of Agriculture policies, benefits of this program are available to all, regardless of race, color, national origin, sex, religion, marital status, handicap, or age.

Major fieldwork for this soil survey was completed in 1983. Soil names and descriptions were approved in 1988. Unless otherwise indicated, statements in this publication refer to conditions in the survey area in 1985. This survey was made cooperatively by the Soil Conservation Service, the Forest Service, and the West Virginia Agricultural and Forestry Experiment Station. It is part of the technical assistance furnished to the Potomac Valley Soil Conservation District.

An earlier survey, "Soil Survey of Hardy and Pendleton Counties, West Virginia," was published in 1930 *(12)*. The current survey updates the earlier one and provides additional information and larger scale maps.

In November 1985, flooding in this survey area significantly affected the soils on flood plains. The effects of the flooding included widening of the river channels as a result of excessive streambank erosion, formation of river channels in previously cropped areas, scouring of the soils several inches to several feet deep in some areas, and deposition of cobbles, sand, and silt on many acres of the soils.

After the flooding, debris was removed and the soils were excavated and graded. Much of the deposited soil material and rock fragments was used as fill material in the newly formed channels and scoured areas. This soil survey was already in progress at the time of the flooding; therefore, only the soils in the most disturbed areas were remapped. The numerous smaller effects of the flooding are not indicated on the soil maps.

Soil maps in this survey may be copied without permission. Enlargement of these maps, however, could cause misunderstanding of the detail of mapping. If enlarged, maps do not show the small areas of contrasting soils that could have been shown at a larger scale.

Cover: Typical area of Pendleton County, West Virginia, showing the rugged mountainous terrain and areas of Rock outcrop.

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Issued February 1992

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Foreword

This soil survey contains information that can be used in land-planning programs in Pendleton County. It contains predictions of soil behavior for selected land uses. The survey also highlights limitations and hazards inherent in the soil, improvements needed to overcome the limitations, and the impact of selected land uses on the environment.

This soil survey is designed for many different users. Farmers, ranchers, foresters, and agronomists can use it to evaluate the potential of the soil and the management needed for maximum food and fiber production. Planners, community officials, engineers, developers, builders, and home buyers can use the survey to plan land use, select sites for construction, and identify special practices needed to ensure proper performance. Conservationists, teachers, students, and specialists in recreation, wildlife management, waste disposal, and pollution control can use the survey to help them understand, protect, and enhance the environment.

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are shallow to bedrock. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

These and many other soil properties that affect land use are described in this soil survey. Broad areas of soils are shown on the general soil map. The location of each soil is shown on the detailed soil maps. Each soil in the survey area is described. Information on specific uses is given for each soil. Help in using this publication and additional information are available at the local office of the Soil Conservation Service or the Cooperative Extension Service.

Rollin N. Swank
State Conservationist
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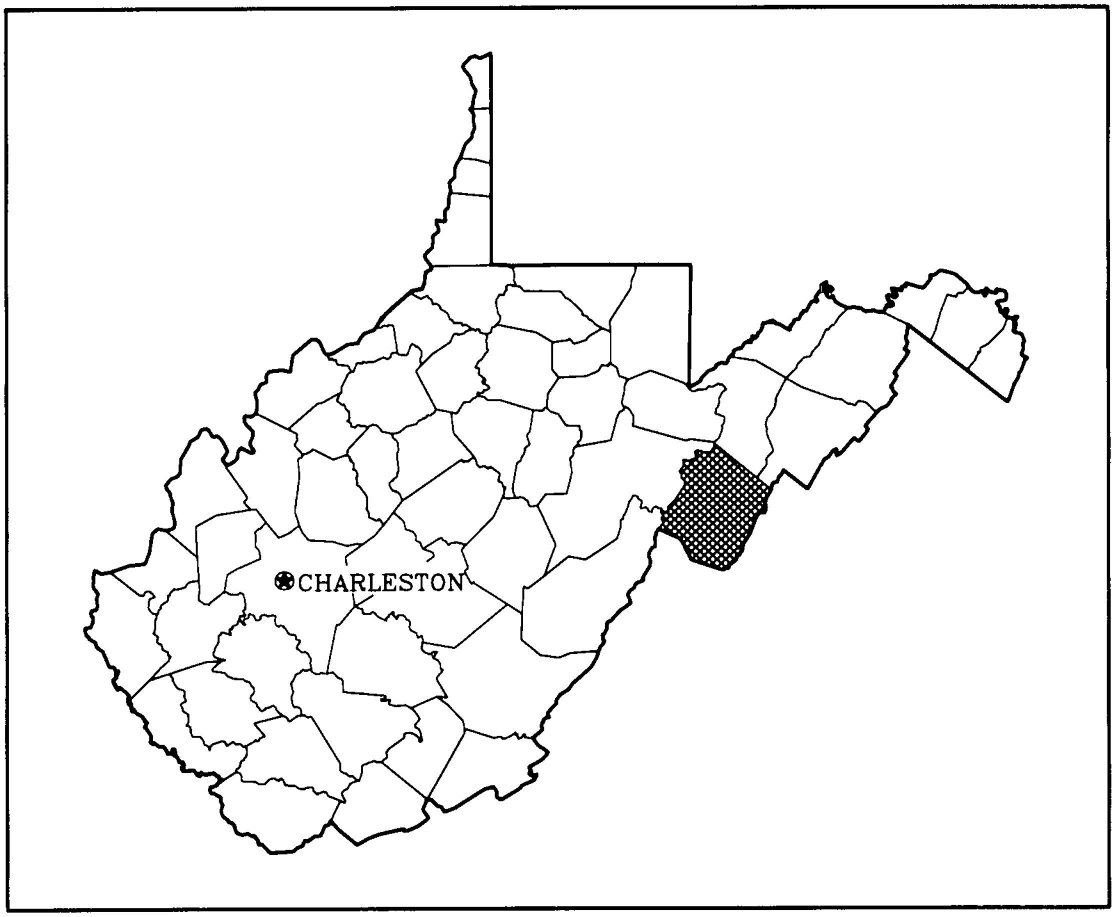

Location of Pendleton County in West Virginia.

Soil Survey of Pendleton County, West Virginia

By Ron Estepp, Soil Conservation Service

Fieldwork by Ron Estepp, Donald G. Flegel, Wayne M. Maresch, Ronnie L. Taylor,
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United States Department of Agriculture, Soil Conservation Service,
in cooperation with
United States Department of Agriculture, Forest Service, and West Virginia Agricultural and
Forestry Experiment Station

General Nature of the County

This section gives general information about the farming trends and the climate in the county.

Farming

The 1974 Census of Agriculture reported a total of 691 farms consisting of 226,810 acres in the county *(16)*.

The main types of farming in the county include raising poultry, beef cattle, sheep, and hogs and producing corn, pasture, hay, and some wheat, oats, and barley. A few dairies also are in the county. Poultry provides the largest farm income, followed by livestock, livestock products, cultivated crops, and hay.

According to the 1974 Census of Agriculture, the market value of the agricultural products produced in the county was the fourth highest in the State. The value of the poultry and poultry products sold was the second highest in the State.

According to the 1970 West Virginia Soil and Water Conservation Needs Inventory, the total acreage of cropland and pasture was about 103,000 *(14)*.

Climate

Prepared by the National Climatic Data Center, Asheville, North Carolina.

Winters are cold and snowy at the higher elevations in the county. They also frequently are cold in the valleys, but the snow cover in these areas thaws intermittently. Summers are fairly warm on the mountain slopes. They are very warm and include occasional very hot days in the valleys.

Rainfall is evenly distributed year round, but it is appreciably heavier on the windward, west-facing mountain slopes than in the valleys. Normal annual precipitation generally is adequate for all crops, but the temperatures in summer and the length of the growing season, particularly at higher elevations, are inadequate for some crops. During periodic droughts in summer, insufficient moisture is available for crops (fig. 1). In recent history, droughts occurred in 1963-66 and 1976-77.

The Allegheny Mountains run along the western edge of the county and form a "rainshadow," which shelters most of the county from the prevailing storm systems that move from west to east. Therefore, the average temperature is lower and the average precipitation is higher in the western part of the county (see Spruce Knob climatic data in table 1) than in the central and eastern parts (see Franklin climatic data). The Spruce Knob weather station actually is about 1.5 miles southeast of Spruce Knob and 1,811 feet lower in elevation.

Table 1 gives data on temperature and precipitation for the survey area as recorded at Franklin and Spruce Knob in the period 1951 to 1979. Table 2 shows probable dates of the first freeze in fall and the last

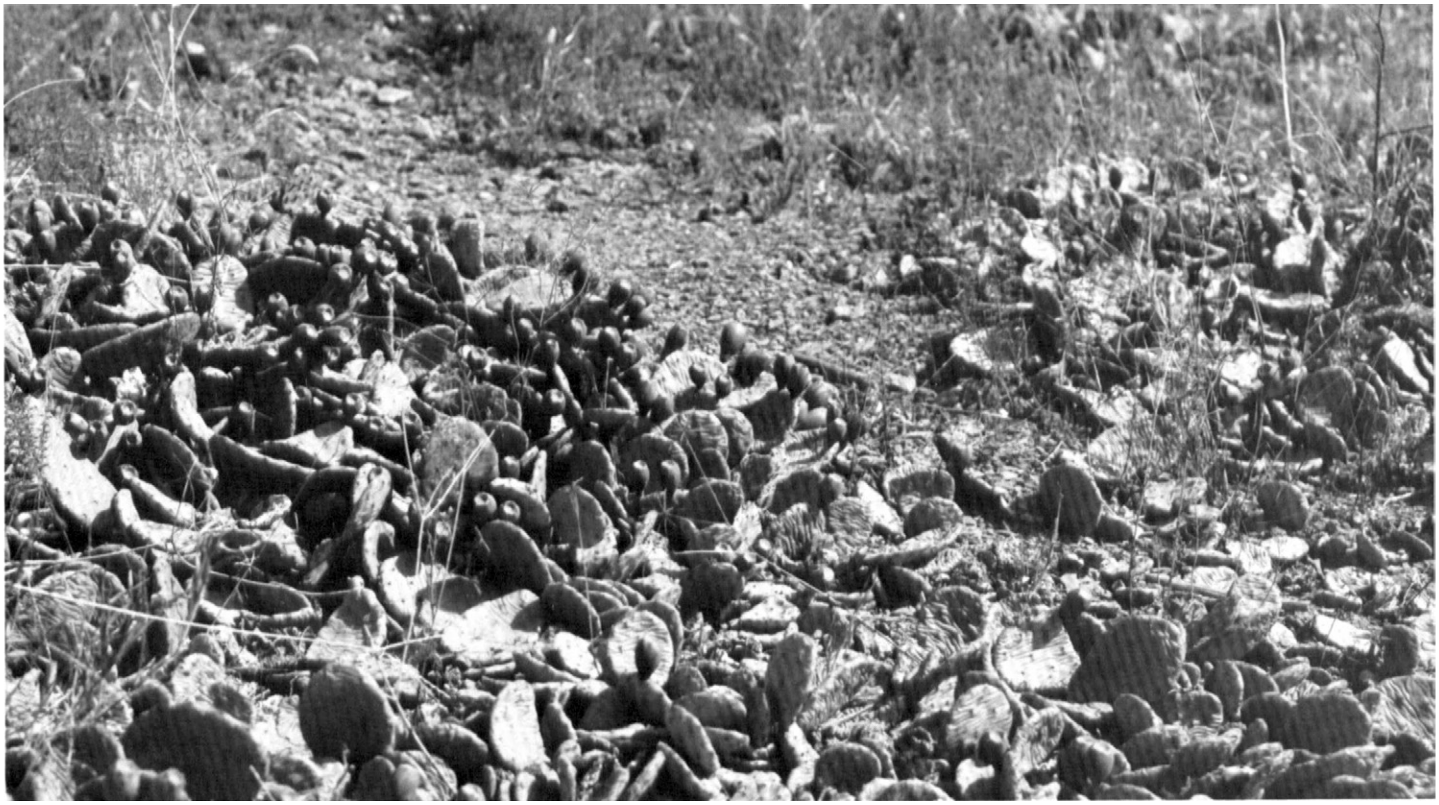

Figure 1.—Because of the periodic droughts in summer, pricklypear grows naturally in areas of Berks-Welkert channery silt loams, 25 to 55 percent slopes, severely eroded.

freeze in spring. Table 3 provides data on length of the growing season.

In winter in the Franklin area, the average temperature is 33 degrees F and the average daily minimum temperature is 22 degrees. In summer, the average temperature is 69 degrees and the average daily maximum temperature is 82 degrees. The highest recorded temperature, which occurred at Franklin on July 14, 1954, is 99 degrees.

In winter in the Spruce Knob area, the average temperature is 28 degrees and the average daily minimum temperature is 18 degrees. The lowest temperature on record, which occurred at Spruce Knob on January 17, 1977, is -24 degrees. In summer, the average temperature is 66 degrees and the average daily maximum temperature is 76 degrees.

Growing degree days are shown in table 1. They are equivalent to "heat units." During the month, growing degree days accumulate by the amount that the average temperature each day exceeds a base temperature of 40 degrees. The normal monthly accumulation is used to schedule single or successive plantings of a crop between the last freeze in spring and the first freeze in fall.

In the Franklin area, about 18.5 inches, or 57 percent, of the total annual precipitation usually falls in April through September. The growing season for most crops falls within this period. In 2 years out of 10, the rainfall in April through September is less than 10 inches. The heaviest 1-day rainfall during the period of record, excluding the period of flooding in 1985, was 5.28 inches at Franklin on October 16, 1954.

In the Spruce Knob area, about 22.5 inches, or 53 percent, of the total annual precipitation usually falls in April through September. The growing season for most crops falls within this period. In 2 years out of 10, the rainfall in April through September is less than 13 inches. The heaviest 1-day rainfall during the period of record was 5.04 inches at Spruce Knob on October 16, 1954.

In the Franklin area, the average seasonal snowfall is 31 inches. The greatest snow depth at any one time during the period of record was 21 inches. On the average, 24 days have at least 1 inch of snow on the ground. The number of such days varies greatly from year to year.

In the Spruce Knob area, the average seasonal snowfall is 111 inches. The greatest snow depth at any one time during the period of record was 31 inches. On the average, 55 days have at least 1 inch of snow on the ground.

The average relative humidity in midafternoon is about 60 percent. Humidity is higher at night, and the average at dawn is about 90 percent. The sun shines 65 percent of the time possible in summer and 50 percent in winter. The prevailing wind is from the northwest. Average windspeed is highest, 8 miles per hour, in spring.

Heavy rains, which can occur any time during the year, and severe thunderstorms, most of which occur in summer, sometimes cause flash flooding in the narrow valleys. Thunderstorms occur on about 44 days each year.

How This Survey Was Made

This survey was made to provide information about the soils in the survey area. The information includes a description of the soils and their location and a discussion of the suitability, limitations, and management of the soils for specified uses. Soil scientists observed the steepness, length, and shape of slopes; the general pattern of drainage; the kinds of crops and native plants growing on the soils; and the kinds of bedrock. They dug many holes to study the soil profile, which is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biologic activity.

The soils in the survey area occur in an orderly pattern that is related to the geology, the landforms, relief, climate, and the natural vegetation of the area. Each kind of soil is associated with a particular kind of landscape or with a segment of the landscape. By observing the soils in the survey area and relating their position to specific segments of the landscape, a soil scientist develops a concept, or model, of how the soils were formed. Thus, during mapping, this model enables the soil scientist to predict with considerable accuracy the kind of soil at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, acidity, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. The system of taxonomic classification used in the United States is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpreted the data from these analyses and tests as well as the field-observed characteristics and the soil properties in terms of expected behavior of the soils under different uses. Interpretations for all of the soils were field tested through observation of the soils in different uses under different levels of management. Some interpretations are modified to fit local conditions, and new interpretations sometimes are developed to meet local needs. Data were assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management were assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can state with a fairly high degree of probability that a given soil will have a high water table within certain depths in most years, but they cannot assure that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Map Unit Composition

A map unit delineation on a soil map represents an area dominated by one major kind of soil or an area dominated by several kinds of soil. A map unit is identified and named according to the taxonomic classification of the dominant soil or soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural objects. In common with other natural objects, they have a characteristic variability in their properties. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of soils of other taxonomic classes. Consequently, every map unit is made up of the soil or soils for which it is named and some soils that belong to other taxonomic classes. These latter soils are called inclusions or included soils.

Most inclusions have properties and behavioral patterns similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting (similar) inclusions. They may or may not be mentioned in the map unit descriptions. Other inclusions, however, have properties and behavior divergent enough to affect use or require different management. These are contrasting (dissimilar) inclusions. They generally occupy small areas and cannot be shown separately on the soil maps because of the scale used in mapping. The inclusions of contrasting soils are mentioned in the map unit descriptions. A few inclusions may not have been observed and consequently are not mentioned in the descriptions, especially where the soil pattern was so complex that it was impractical to make enough observations to identify all of the kinds of soil on the landscape.

The objective of soil mapping is not to delineate pure taxonomic classes of soils but rather to separate the landscape into segments that have similar use and management requirements. The delineation of such landscape segments on the map provides sufficient information for the development of resource plans, but onsite investigation is needed to plan for intensive uses in small areas.

General Soil Map Units

The general soil map at the back of this publication shows the general soil map units in this survey area. Each unit has a distinctive pattern of soils, relief, and drainage. Each is a unique natural landscape. Typically, a map unit consists of one or more major soils and some minor soils. It is named for the major soils. The soils making up one unit can occur in another but in a different pattern.

The general soil map can be used to compare the suitability of large areas for general land uses. Areas of suitable soils can be identified on the map. Likewise, areas where the soils are not suitable can be identified.

Because of its small scale, the map is not suitable for planning the management of a farm or field or for selecting a site for a road or building or other structure. The soils in any one map unit differ from place to place in slope, depth, drainage, and other characteristics that affect management.

The soils on this general soil map are adjacent to those of Grant, Hardy, and Randolph Counties, West Virginia, and of Augusta and Rockingham Counties, Virginia. Differences in the names and proportions of the soils in the map units are the result of varying legend designs, map scales, and degrees of generalization.

Soil Descriptions

1. Dekalb-Blackthorn-Elliber

Moderately deep and very deep, well drained, gently sloping to extremely steep soils; on uplands

This map unit consists of rugged mountainous areas dissected by narrow valleys that have a trellised drainage pattern. The unit is on all of the mountain ranges between the North and South Forks of the South Branch of the Potomac River. Slopes range from 3 to 80 percent. The natural vegetation is mostly hardwoods and a few conifers.

The unit makes up about 33 percent of the survey area. It is about 22 percent Dekalb soils, 21 percent Blackthorn soils, 13 percent Elliber soils, and 44 percent soils of minor extent. The minor soils are Buchanan and Laidig soils on foot slopes, in coves, along drainageways, and on benches and Opequon, Edom, Lehew, and Hazleton soils on hillsides, benches, and ridgetops.

Dekalb soils are on hillsides, benches, and ridgetops. They are moderately deep and are gently sloping to extremely steep. They have a yellowish brown, moderately coarse textured subsoil. These soils formed in acid material weathered from sandstone.

Blackthorn soils are on the lower hillsides, on foot slopes, and in coves. They are very deep and are gently sloping to very steep. They are yellowish brown, brownish yellow, and light yellowish brown, moderately coarse textured and medium textured, and very channery in the upper part of the subsoil and are yellowish red and fine textured in the lower part of the subsoil. These soils formed in areas underlain by limestone or limy shale.

Elliber soils are on hillsides, benches, and ridgetops. They are very deep and are gently sloping to extremely steep. They have a brownish yellow and light yellowish brown, extremely channery, medium textured subsoil. These soils formed in areas underlain by cherty bedrock.

About 80 percent of this map unit is wooded. Some of the minor soils underlain by limestone have been cleared for use as native bluegrass pasture. Small areas on the narrow flood plains and on foot slopes are used for the production of grain. The trees on the Dekalb soils are dominantly chestnut oak and Virginia pine. The trees on the Blackthorn and Elliber soils are dominantly white oak, red oak, white pine, and black locust. A few limestone quarries and a few chert quarries, which are used as a source of gravel for roadfill, are in areas of this unit.

The slope of all the major soils and the limited depth to bedrock in the Dekalb soils are limitations affecting most urban uses. The pollution of ground water by waste disposal facilities is a hazard, especially in areas underlain by cavernous limestone.

2. Berks-Weikert

Moderately deep and shallow, well drained, strongly *sloping to extremely steep soils; on uplands*

This map unit consists of rugged mountainous areas on Shenandoah Mountain and immediately east of the Fore Knobs. It also consists of strongly sloping and moderately steep areas along the valleys of the South Fork of the South Branch of the Potomac River and along North Mill Creek. The unit is dissected by a dendritic drainage pattern. Most of the acreage of the George Washington National Forest in Pendleton County is in this unit. Slopes range from 8 to 80 percent. The natural vegetation is mostly hardwoods and some conifers.

This map unit makes up about 21 percent of the survey area. It is about 47 percent Berks soils, 23 percent Weikert soils, and 30 percent soils of minor extent. The minor soils are Shouns, Ernest, and Clarksburg soils on foot slopes, in coves, along drainageways, and on benches and Potomac soils on the flood plains along small streams.

Berks soils are on hillsides, benches, and ridgetops. They are moderately deep. They have a medium textured subsoil. These soils formed in acid material weathered mostly from shale and siltstone and from some sandstone.

Weikert soils are on hillsides, benches, and ridgetops. They are shallow, medium textured soils that formed in material weathered mostly from shale and siltstone and from some sandstone. Most areas of these soils are on southern and western exposures.

About 80 percent of this unit is wooded. Strongly sloping and moderately steep areas along the valleys have been cleared and are used for grassland farming or as sites for dwellings. Minor soils on small flood plains and on foot slopes are used for the production of grain. The trees on this unit are dominantly chestnut oak, black oak, Virginia pine, red oak, and white oak. They grow slowly on the major soils. Cleared areas are used mainly for pasture. These soils are droughty because of the depth to bedrock. They are easily overgrazed. Severely eroding pastures are common. Small shale quarries, which are used as a source of roadfill, are common.

The slope and the depth to bedrock are limitations affecting most urban uses.

3. Calvin-Dekalb-Hazleton

Moderately deep to very deep, well drained, gently sloping to extremely steep soils; on uplands

This map unit consists of rugged, mountainous areas on the higher elevations of Shenandoah Mountain, the steeper hillsides east of Timber Ridge, and adjacent to Big Run and Seneca Creek. The unit is dissected by a dendritic drainage pattern. Some of the more scenic areas of the George Washington National Forest in Pendleton County are in this unit. Slopes range from 3 to 80 percent. The natural vegetation is mostly hardwoods and some conifers.

This map unit makes up about 11 percent of the survey area. It is about 39 percent Calvin soils, 20 percent Dekalb soils, 20 percent Hazleton soils, and 21 percent soils of minor extent and areas of Rock outcrop and Rubble land. The minor soils are Buchanan, Ernest, Laidig, and Shouns soils on foot slopes, in coves, along drainageways, on benches, and on the lower slopes of hillsides and Berks, Lehew, and Weikert soils on ridgetops, benches, and hillsides. The areas of Rock outcrop and Rubble land are on hillsides and ridgetops.

Calvin soils are on ridgetops, benches, and hillsides. They are moderately deep. They have a reddish brown, medium textured subsoil. These soils formed in material weathered from interbedded shale, siltstone, and sandstone.

Dekalb soils are on ridgetops, benches, and hillsides. They are moderately deep. They have a yellowish brown, moderately coarse textured subsoil. These soils formed in acid material weathered from sandstone.

Hazleton soils are dominantly on hillsides and benches. They are deep and very deep. They have a mostly yellowish brown, moderately coarse textured subsoil. These soils formed in acid material weathered from sandstone.

About 85 percent of this unit is wooded. Some areas, mainly the gently sloping to moderately steep Calvin, Lehew, and Berks soils on ridgetops, have been cleared for use as pasture or hay. The trees are dominantly chestnut oak, black oak, Virginia pine, red oak, and white oak. Some American beech, yellow birch, and black cherry are along Big Run and Seneca Creek. Trees grow slowly on the Calvin and Dekalb soils.

The slope of all the major soils and the depth to bedrock in the Calvin and Dekalb soils are limitations affecting most urban uses. The bedrock in the Calvin soils is usually rippable. Because this unit is in remote areas of the county, it rarely is used for urban development.

4. Potomac-Clarksburg-Ernest

Very deep, somewhat excessively drained and moderately well drained, nearly level to moderately steep soils; on flood plains and uplands

This map unit is in broad valleys along the major streams in the survey area (fig. 2). Much of the unit is on the flood plains along the three rivers in the county. Slopes range from 0 to 25 percent.

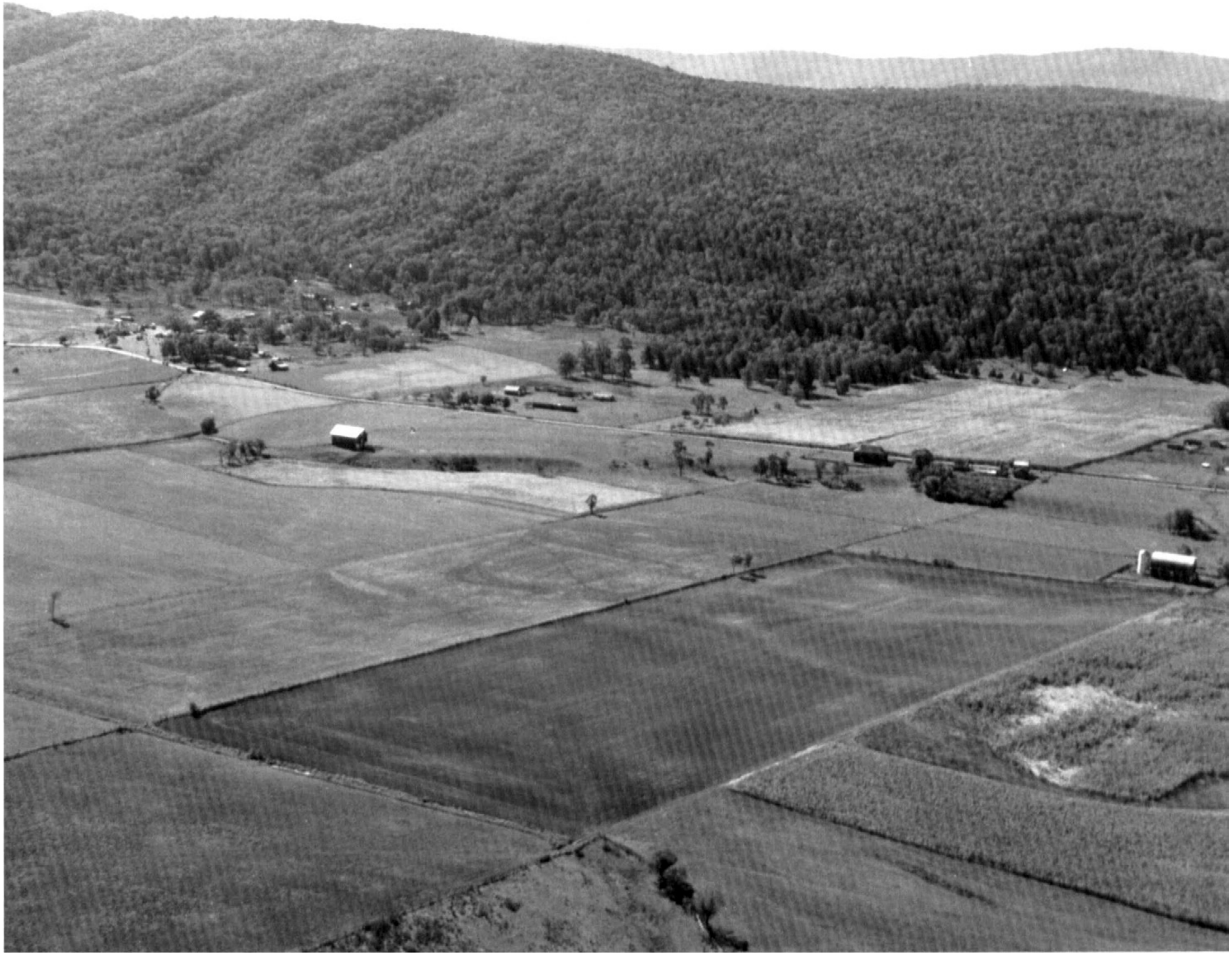

Figure 2.—Typical area of general soil map unit 4 in a broad valley.

This map unit makes up about 7 percent of the survey area. It is about 43 percent Potomac soils, 22 percent Clarksburg soils, 15 percent Ernest soils, and 20 percent soils of minor extent and outcrops of shale. The minor soils are Chagrin, Dunning, Lobdell, Orrville, and Tioga soils on flood plains; Buchanan and Laidig soils on foot slopes, in coves, along drainageways, and on benches; and Allegheny, Monongahela, and Tygart soils on terraces. Outcrops of shale are common along escarpments, which commonly separate the flood plains from terraces.

The nearly level Potomac soils are on flood plains. They are somewhat excessively drained. They have a brown and dark brown, coarse textured, very gravelly to extremely gravelly substratum. These soils formed in gravelly alluvial material.

The gently sloping to moderately steep Clarksburg soils are on foot slopes, in coves, along drainageways, and on benches. They are moderately well drained. They have a medium textured to moderately fine textured, strong brown and yellowish red subsoil that has a fragipan. Permeability is moderately slow or slow in the fragipan. These soils formed in colluvial material.

The gently sloping to moderately steep Ernest soils are on foot slopes, in coves, along drainageways, and on benches. They are moderately well drained. They have a medium textured, dark yellowish brown, brown, and yellowish brown subsoil that has a fragipan. Permeability is moderately slow or slow in the fragipan. These soils formed in acid colluvial material.

Most of this map unit has been cleared of trees. It is used intensively for row crops, hay, or pasture. Some of the minor soils on the flood plains are the most productive soils in the county for the commonly grown crops.

The soils above the flood plain are used for urban development. Most of the major roads in the county pass through areas of this unit. Dwellings and commercial buildings can be conveniently constructed in the areas that are not subject to flooding. The seasonal high water table, the moderately slow or slow permeability, and the hazard of flooding are limitations affecting most urban uses.

5. Lehew-Hazleton-Dekalb

Moderately deep to very deep, well drained, gently sloping to extremely steep soils; on uplands

This map unit is on the ridgetops, benches, and rugged side slopes at the upper elevations of North Fork Mountain. Some of the more scenic areas of the Seneca Rocks Unit of the Spruce Knob-Seneca Rocks National Recreation Area are in this map unit. Slopes range from 3 to 80 percent. The natural vegetation is mostly hardwoods and a few conifers.

This map unit makes up about 5 percent of the survey area. It is about 40 percent Lehew soils, 39 percent Hazleton soils, 15 percent Dekalb soils, and 6 percent soils of minor extent and areas of Rock outcrop and Rubble land. The minor soils are Buchanan and Laidig soils on foot slopes, in coves, along small drainageways, and on benches. The areas of Rock outcrop and Rubble land are on hillsides and ridgetops. Vertical rock cliffs are common along the western crest of North Fork Mountain.

Lehew soils are on ridgetops, benches, and hillsides. They are moderately deep. They have a reddish brown and dark reddish brown, moderately coarse textured subsoil. These soils formed in acid material weathered from sandstone.

Hazleton soils are mostly on hillsides and benches. They are deep and very deep. They have a mostly yellowish brown, moderately coarse textured subsoil. These soils formed in acid material weathered from sandstone.

Dekalb soils are on ridgetops, benches, and hillsides. They are moderately deep. They have a yellowish brown, moderately coarse textured subsoil. These soils formed in acid material weathered from sandstone.

Most of this map unit is wooded. The trees are dominantly chestnut oak, red oak, black oak, Virginia pine, and white oak. American chestnut saplings also are common. A few mountain ash trees also grow in areas of this unit. Trees grow slowly on the Lehew and Dekalb soils.

The slope of all three major soils and the depth to bedrock in the Lehew and Dekalb soils are limitations affecting most urban uses. Because this unit is in remote areas of the county, it is seldom used for urban development.

6. Cateache-Shouns-Belmont

Moderately deep to very deep, well drained, gently sloping to extremely steep soils; on uplands

This map unit is on ridgetops, benches, and hillsides along parts of the Allegheny Front, along Timber Ridge, and in the Hunting Ground Mountain area in the western part of the county. Slopes range from 3 to 80 percent. The natural vegetation is mostly hardwoods and a few conifers.

This map unit makes up about 8 percent of the survey area. It is about 48 percent Cateache soils, 34 percent Shouns soils, 13 percent Belmont soils, and 5 percent soils of minor extent. The minor soils are Dekalb soils on hillsides, ridgetops, and benches and Laidig and Buchanan soils on foot slopes, in coves, along drainageways, and on benches.

Cateache soils are on ridgetops, benches, and hillsides. They are moderately deep. They have a reddish brown and dark reddish brown, medium textured subsoil. These soils formed in material weathered dominantly from siltstone and from shale that is calcareous in some places.

Shouns soils are on foot slopes, in coves, on benches, and on the lower hillsides. They are very deep. They have a reddish brown and dark red, medium textured subsoil. These soils formed in mixed colluvial material weathered from shale, siltstone, sandstone, and limestone.

Belmont soils are on ridgetops, benches, and hillsides. They are deep. They have a reddish brown, medium textured and moderately fine textured subsoil. These soils formed in material weathered from limestone and calcareous shale.

About 75 percent of this map unit is wooded. Some areas, mostly the gently sloping to moderately steep Belmont and Cateache soils on benches and along ridgetops, have been cleared for use mainly as pasture and for hay. The trees are dominantly sugar maple.

Mixed oaks also are at the lower elevations, and red spruce and American beech are at the higher elevations. American basswood, black cherry, and cucumbertree also are common.

The slope of all three major soils, the depth to bedrock and the hazard of slippage in areas of the Cateache soils, and the stones in some areas of the Shouns soils are limitations affecting most urban uses. The pollution of ground water by waste disposal facilities is a hazard, especially in areas underlain by cavernous limestone.

7. Mandy-Gauley-Trussel

Moderately deep and very deep, well drained and poorly drained, gently sloping to extremely steep soils; on uplands at high elevations

This map unit is on ridgetops and the upper slopes on the Appalachian Plateau and on Spruce Mountain, in the western part of the county. The unit is in the highest and coldest part of the county. Many areas are rubbly. Slopes range from 3 to 80 percent. The natural vegetation is hardwoods, spruce, and stunted brushy species.

This map unit makes up about 2 percent of the survey area. It is about 50 percent Mandy soils, 36 percent Gauley soils, 9 percent Trussel soils, and 5 percent soils of minor extent and areas of Rock outcrop and Rubble land. The minor soils are the moderately well drained Simoda soils on ridgetops and benches. The areas of Rock outcrop and Rubble land are on ridgetops and hillsides.

The gently sloping to very steep Mandy soils are on ridgetops, benches, and hillsides. They are moderately deep and well drained. They have a medium textured, brown and yellowish brown subsoil. These soils formed in material weathered from interbedded siltstone, shale, and sandstone.

The gently sloping to extremely steep Gauley soils are on ridgetops, benches, and hillsides. They are moderately deep and well drained. They have a medium textured, dark reddish brown, reddish brown, and brown subsoil. These soils formed in acid material weathered from sandstone.

The gently sloping to strongly sloping Trussel soils are on foot slopes, in coves, and along drainageways. They are very deep and poorly drained. They have a medium textured to moderately fine textured, light brownish gray, strong brown, grayish brown, and yellowish brown subsoil. These soils formed in colluvial material.

About 75 percent of this map unit is wooded. The vegetation in nonwooded areas is mainly a mixture of native grasses, mosses, brushy hardwood, and red spruce. The wooded areas of the Mandy soils support mainly red maple, American beech, red spruce, and black cherry, and those of the Gauley and Trussel soils support mainly red spruce, red maple, and yellow birch.

The stoniness, the depth to bedrock, and wetness are limitations affecting most urban uses. Because the unit is in remote areas, it seldom is used for urban development.

8. Opequon-Berks-Blackthorn

Shallow, moderately deep, and very deep, well drained, gently sloping to extremely steep soils; on uplands

This map unit is on ridgetops, hillsides, benches, and foot slopes in the Germany Valley area and some scattered areas in the watersheds of the South Branch of the Potomac River and the South Fork of the South Branch of the Potomac River. The Blackthorn soils are more commonly in the South Fork and South Branch Watershed areas than in the Germany Valley area. Slopes range from 3 to 80 percent.

This map unit makes up about 13 percent of the survey area. It is about 42 percent Opequon soils, 23 percent Berks soils, 6 percent Blackthorn soils, and 29 percent soils of minor extent. The minor soils are Caneyville, Dekalb, Edom, and Weikert soils on ridgetops, benches, and hillsides and Buchanan, Clarksburg, Ernest, Laidig, and Toms soils on foot slopes, in coves, along drainageways, and on benches.

The gently sloping to extremely steep Opequon soils are on ridgetops, benches, and hillsides. They are shallow. They have a yellowish red and reddish brown, fine textured subsoil. These soils formed in material weathered from limestone or limy shale.

The gently sloping to extremely steep Berks soils are on ridgetops, benches, and hillsides. They are moderately deep. They have a brownish yellow and strong brown, medium textured subsoil. These soils formed in acid material weathered mostly from shale and siltstone and from some sandstone.

The gently sloping to very steep Blackthorn soils are on the lower hillsides, on foot slopes, on benches, and in coves. They are very deep. They are yellowish brown, brownish yellow, and light yellowish brown, moderately coarse textured and medium textured, and very channery in the upper part of the subsoil and are yellowish red and fine textured in the lower part of the subsoil. These soils formed in material weathered from limestone or limy shale.

Most of this map unit has been cleared of trees and is used for pasture or hay (fig. 3). The minor soils on small flood plains and foot slopes are used for the production of grain. The wooded areas of the Opequon soils support white oak, red oak, redcedar, and black

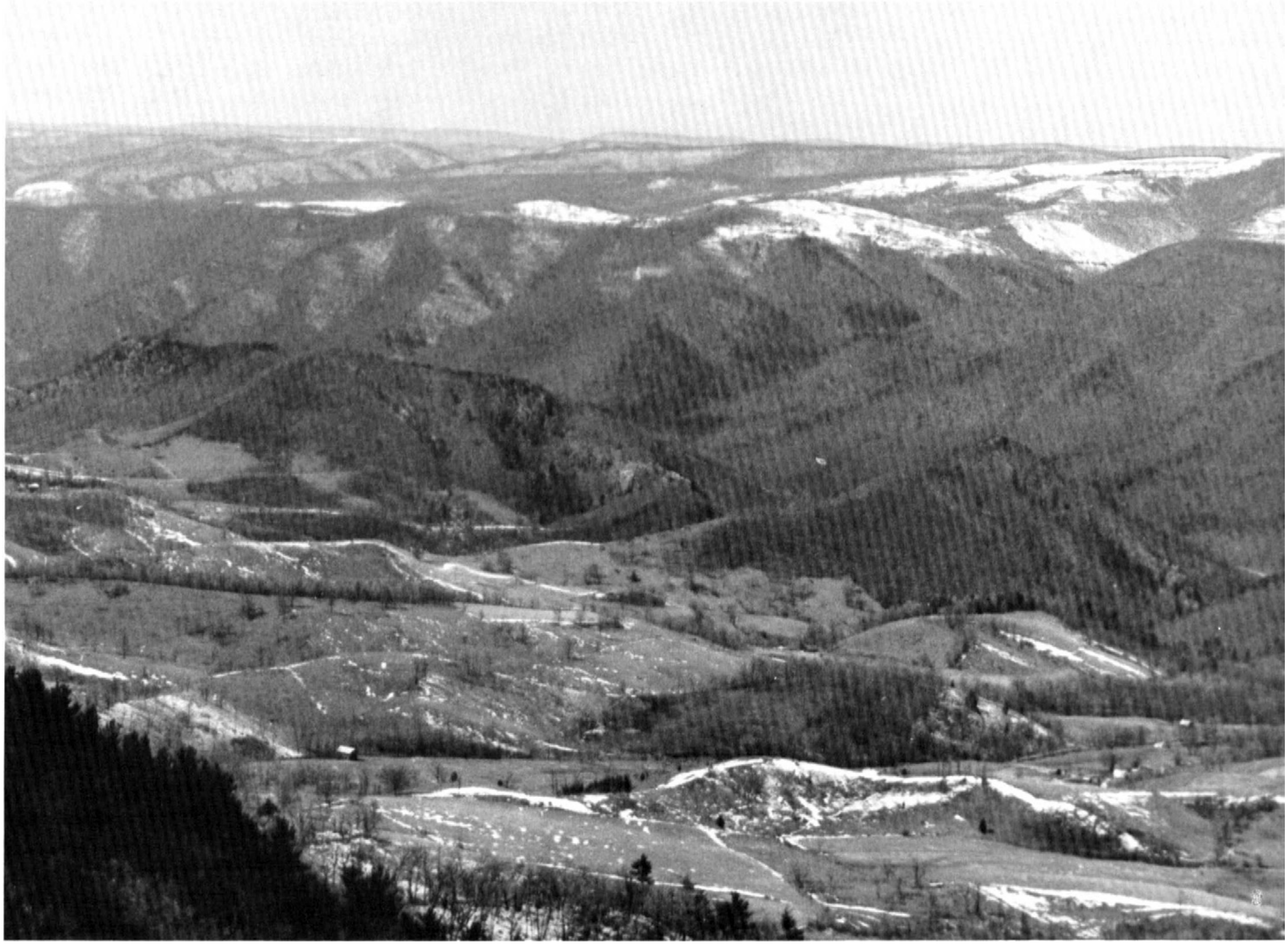

Figure 3.—Typical area of general soil map unit 8 in a valley. Most of this unit is used for pasture and hay.

walnut, those of the Berks soils commonly support chestnut oak, black oak, and Virginia pine, and those of the Blackthorn soils commonly support red oak, white oak, black walnut, and white pine. Trees grow slowly on the Opequon and Berks soils. Many of the pastures are too steep to use the conventional methods of applying fertilizer. Bluegrass usually dominates the Opequon soils, but low quality grasses usually dominate the more acidic Berks and Blackthorn soils. A few limestone quarries are in this unit.

The slope of all three major soils and the depth to bedrock in the Opequon and Berks soils are limitations for most urban uses. The pollution of ground water by waste disposal facilities is a hazard, especially in areas underlain by cavernous limestone.

Detailed Soil Map Units

The map units on the detailed soil maps at the back of this survey represent the soils in the survey area. The map unit descriptions in this section, along with the soil maps, can be used to determine the suitability and potential of a soil for specific uses. They also can be used to plan the management needed for those uses. More information on each map unit, or soil, is given under "Use and Management of the Soils."

Each map unit on the detailed soil maps represents an area on the landscape and consists of one or more soils for which the unit is named.

A symbol identifying the soil precedes the map unit name in the soil descriptions. Each description includes general facts about the soil and gives the principal hazards and limitations to be considered in planning for specific uses.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer or of the underlying material, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer or of the underlying material. They also can differ in slope, stoniness, salinity, wetness, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Berks channery loam, 15 to 35 percent slopes, stony, is a phase of the Berks series.

Some map units are made up of two or more major soils. These map units are called soil complexes, soil associations, or undifferentiated groups.

A *soil complex* consists of two or more soils, or one or more soils and a miscellaneous area, in such an intricate pattern or in such small areas that they cannot be shown separately on the soil maps. The pattern and proportion of the soils are somewhat similar in all areas. Berks-Weikert channery silt loams, 8 to 15 percent slopes, is an example.

A *soil association* is made up of two or more geographically associated soils that are shown as one unit on the maps. Because of present or anticipated soil uses in the survey area, it was not considered practical or necessary to map the soils separately. The pattern and relative proportion of the soils are somewhat similar. Blackthorn-Dekalb-Elliber association, 3 to 15 percent slopes, stony, is an example.

An *undifferentiated group* is made up of two or more soils that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils in the mapped areas are not uniform. An area can be made up of only one of the major soils, or it can be made up of all of them. Lehew and Dekalb soils, 8 to 15 percent slopes, is an undifferentiated group in this survey area.

Most map units include small scattered areas of soils other than those for which the map unit is named. Some of these included soils have properties that differ substantially from those of the major soil or soils. Such differences could significantly affect use and management of the soils in the map unit. The included soils are identified in each map unit description. Some small areas of strongly contrasting soils are identified by a special symbol on the soil maps.

This survey includes *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Areas of Rock outcrop and Rubble land are examples. Miscellaneous areas are shown on the soil maps. Some that are too small to be shown are identified by a special symbol on the soil maps.

Table 4 gives the acreage and proportionate extent of each map unit. Other tables (see "Summary of Tables") give properties of the soils and the limitations, capabilities, and potentials for many uses. The Glossary defines many of the terms used in describing the soils.

Soil Descriptions

AgB—Allegheny loam, 3 to 8 percent slopes. This soil is very deep, gently sloping, and well drained. It is on smooth stream terraces in the river valleys at elevations above the flood plains.

Typically, the surface layer is dark yellowish brown loam about 8 inches thick. The subsoil extends to a depth of 65 inches or more. The upper 25 inches is yellowish brown loam and silt loam. The next 18 inches is yellowish brown loam mottled with brownish yellow, pale brown, and dark red. The lower 14 inches is yellowish brown gravelly loam mottled with yellow, grayish brown, and yellowish red.

Included with this soil in mapping are a few areas of Monongahela soils; a few areas of soils that have a gravelly surface layer; several areas of soils that have a red, reddish brown, or yellowish red subsoil; and a few areas of soils that have very gravelly and very cobbly layers below a depth of 30 inches. Also included are a few areas where slopes are less than 3 or more than 8 percent. Included soils make up about 25 percent of this map unit.

The available water capacity of the Allegheny soil is moderate or high, and permeability is moderate. Runoff is medium. Natural fertility is low. The surface layer is friable and can be easily tilled. This soil generally is strongly acid or very strongly acid. Many areas have been limed. The surface layer in these areas is slightly acid or neutral. The rooting depth is 40 inches or more. The depth to bedrock is more than 60 inches.

Most areas of this soil are used for cultivated crops or hay. A few areas are used for pasture or woodland.

This soil is suited to cultivated crops. Erosion is a moderate hazard in unprotected areas. Including hay in the crop rotation, applying a system of conservation tillage, farming on the contour, growing cover crops and green manure crops, and returning crop residue to the soil help to control erosion and maintain tilth.

This soil is suited to hay and pasture. Erosion is a moderate hazard if the plant cover is removed by overgrazing. A planned grazing system that includes rotational grazing, proper stocking rates, and cutting of hay at the proper stages of maturity help to control erosion and maintain the desirable species of plants.

A small acreage is wooded. The potential productivity of this soil for trees is moderately high. Few limitations affect woodland management, but plant competition is severe when openings are made in the canopy. Erosion on logging roads and skid trails also is a management concern. It can be controlled by building the roads and trails on the contour. White oak, red oak, black oak, white pine, and Virginia pine are the dominant species.

This soil has few limitations as a site for dwellings, septic tank absorption fields, and local roads and streets. It is among the best soils in the county for building site development, but excessive erosion on construction sites should be prevented by establishing a plant cover and controlling runoff.

The capability subclass is IIe.

AgC—Allegheny loam, 8 to 15 percent slopes. This soil is very deep, strongly sloping, and well drained. It is on smooth stream terraces in the river valleys at elevations above the flood plains.

Typically, the surface layer is dark yellowish brown loam about 7 inches thick. The subsoil extends to a depth of 65 inches or more. The upper 26 inches is yellowish brown loam and silt loam. The next 18 inches is yellowish brown loam mottled with brownish yellow, pale brown, and dark red. The lower 14 inches is yellowish brown gravelly loam mottled with yellow, grayish brown, and yellowish red.

Included with this soil in mapping are a few areas of Monongahela soils; a few areas of soils that have a gravelly surface layer; several areas of soils that have a red, reddish brown, or yellowish red subsoil; and a few areas of soils that have very gravelly and very cobbly layers below a depth of 30 inches. Also included are a few areas where slopes are less than 8 or more than 15 percent. Included soils make up about 25 percent of this map unit.

The available water capacity of the Allegheny soil is moderate or high, and permeability is moderate. Runoff is rapid. Natural fertility is low. The surface layer is friable and can be easily tilled. This soil generally is strongly acid or very strongly acid. Many areas have been limed. The surface layer in these areas is slightly acid or neutral. The rooting depth is 40 inches or more. The depth to bedrock is more than 60 inches.

Most areas of this soil are used for cultivated crops or hay. A few areas are used for pasture or woodland.

This soil is suited to cultivated crops. Erosion is a severe hazard in unprotected areas. Including hay in the crop rotation, applying a system of conservation tillage, farming on the contour, growing cover crops and green manure crops, contour stripcropping, returning crop residue to the soil, and establishing grassed waterways for the safe removal of concentrated runoff help to control erosion and maintain tilth.

This soil is suited to hay and pasture. Erosion is a severe hazard if the plant cover is removed by overgrazing. A planned grazing system that includes rotational grazing, proper stocking rates, and cutting of hay at the proper stages of maturity help to control erosion and maintain the desirable species of plants.

A small acreage is wooded. The potential productivity of this soil for trees is moderately high. Few limitations affect woodland management, but plant competition is severe when openings are made in the canopy. Erosion on logging roads and skid trails also is a management concern. It can be controlled by building the roads and trails on the contour. White oak, red oak, black oak, white pine, and Virginia pine are the dominant species.

The slope is a moderate limitation on sites for dwellings. The dwellings should be designed so that they conform to the natural slope of the land. The more gently sloping areas are the best sites for dwellings. Establishing a plant cover and controlling runoff help to prevent excessive erosion on construction sites.

The slope is a moderate limitation on sites for local roads and streets. Building the roads on the contour helps to overcome this limitation.

The slope is a moderate limitation on sites for septic tank absorption fields. Installing the absorption fields on the contour results in a more even distribution of effluent.

The capability subclass is IIIe.

BcC—Belmont-Cateache silt loams, 8 to 15 percent slopes. These soils are strongly sloping, well drained, and deep and moderately deep. They are on benches and ridgetops in the mountains west of the North Fork of the South Branch of the Potomac River. Slopes are generally smooth. Outcrops of limestone are in a few areas. This unit is about 50 percent Belmont soil, 30 percent Cateache soil, and 20 percent other soils and Rock outcrop. The Belmont and Cateache soils occur as areas so closely intermingled that it was not practical to map them separately.

Typically, the surface layer of the Belmont soil is dark brown silt loam about 10 inches thick. The subsoil is about 31 inches thick. The upper 8 inches is reddish brown silt loam, and the lower 23 inches is reddish brown silty clay loam. The substratum is reddish brown and dark reddish brown channery silty clay loam. It extends to bedrock at a depth of about 49 inches.

Typically, the surface layer of the Cateache soil is dark brown silt loam about 5 inches thick. The subsoil is about 18 inches thick. The upper 5 inches is dark reddish brown silt loam, and the lower 13 inches is reddish brown channery silt loam. The substratum is reddish brown extremely channery silt loam. It extends to bedrock at a depth of about 27 inches.

Included with these soils in mapping are a few areas of Shouns and Mandy soils, a few areas where stones are on the surface, a few areas where slopes are less than 8 or more than 15 percent, areas of Rock outcrop, and a few areas of soils that are less than 20 inches deep over bedrock. Included areas make up about 20 percent of this map unit.

The available water capacity of the Belmont soil is high, and permeability is moderate. Natural fertility is high. Runoff is rapid. This soil generally is strongly acid to slightly acid in the surface layer and the upper part of the subsoil, moderately acid to neutral in the lower part of the subsoil, and moderately acid to mildly alkaline in the substratum. Some areas have been limed. The surface layer in these areas is neutral. The rooting depth is 40 inches or more. The depth to bedrock is 40 to 60 inches.

The available water capacity of the Cateache soil is low or moderate, and permeability is moderate. Natural fertility is medium. Runoff is rapid. This soil generally is moderately acid to very strongly acid in the surface layer and subsoil and moderately acid or strongly acid in the substratum. Some areas have been limed. The surface layer in these areas is slightly acid or neutral. The roots of some plants are restricted by bedrock at a depth of 20 to 40 inches.

Most areas of this unit are used for hay and pasture. A few areas are used for gardens or woodland.

This unit is suited to cultivated crops, but early maturing varieties should be selected for planting. Early frost is common because of the elevation. Erosion is a severe hazard in unprotected areas. Including hay in the crop rotation, applying a system of conservation tillage, farming on the contour, growing cover crops and green manure crops, contour stripcropping, returning crop residue to the soil, and establishing grassed waterways for the safe removal of concentrated runoff help to control erosion and maintain tilth.

This unit is suited to hay and pasture. Erosion is a severe hazard if the plant cover is removed by overgrazing. Because of a history of pond failures in areas of this unit, alternative water sources are needed for livestock. A planned grazing system that includes rotational grazing, proper stocking rates, and cutting of hay at the proper stages of maturity help to control erosion and maintain the desirable species of plants.

A small acreage is wooded. The potential productivity of this unit for trees is moderately high. Few limitations affect woodland management, but plant competition is moderate or severe when openings are made in the canopy. Erosion on logging roads and skid trails also is a management concern. It can be controlled by building the roads and trails on the contour. Red oak, white oak, sugar maple, and black cherry are the dominant species. Black walnut, black locust, and cucumbertree also are common.

The slope and a moderate shrink-swell potential are limitations on sites for dwellings. The depth to bedrock is an additional limitation, especially on sites for dwellings with basements. The rippable shale underlying the Cateache soil can be more easily excavated than the hard limestone underlying the Belmont soil. The dwellings should be designed so that they conform to the natural slope of the land. The more gently sloping areas are the best sites for dwellings. Extra reinforcement can help footings and foundations to withstand the pressure exerted as the soils swell during wet periods. Also, adding porous backfill adjacent to basement walls helps to reduce this pressure. The included Shouns soils, which are deeper, may be available for building site development. If not, building above the bedrock and landscaping with additional fill material may be preferable to excavating the hard limestone underlying the Belmont soil. Establishing a plant cover and controlling runoff help to prevent excessive erosion on construction sites.

The slope, the shrink-swell potential, frost action, and low strength are limitations on sites for local roads and streets. Providing suitable subgrade or base material can help to prevent the road damage caused by shrinking and swelling, frost action, and low strength. Building the roads on the contour helps to overcome the slope.

The depth to bedrock and the slope are limitations on sites for septic tank absorption fields. The limited depth reduces the capacity of the soils to store effluent from septic tank systems. The limestone underlying the Belmont soil in some areas is cavernous and can allow the effluent to pollute ground water. The included Shouns soils, which are deeper, may be available for use as sites for septic tank absorption fields. The more gently sloping areas are the best sites for these fields. Installing the absorption fields on the contour results in a more even distribution of effluent.

The capability subclass is IIIe.

BcD—Belmont-Cateache silt loams, 15 to 25 percent slopes. These soils are moderately steep, well drained, and deep and moderately deep. They are on hillsides and benches in the mountains west of the North Fork of the South Branch of the Potomac River. Slopes are generally smooth, but some areas are dissected by drainageways. Outcrops of limestone are in a few areas. This unit is about 50 percent Belmont soil, 30 percent Cateache soil, and 20 percent other soils and Rock outcrop. The Belmont and Cateache soils occur as areas so closely intermingled that it was not practical to map them separately.

Typically, the surface layer of the Belmont soil is dark brown silt loam about 9 inches thick. The subsoil is about 31 inches thick. The upper 8 inches is reddish brown silt loam, and the lower 23 inches is reddish brown silty clay loam. The substratum is reddish brown and dark reddish brown channery silty clay loam. It extends to bedrock at a depth of about 48 inches.

Typically, the surface layer of the Cateache soil is dark brown silt loam about 3 inches thick. The subsoil is about 17 inches thick. The upper 5 inches is dark reddish brown silt loam, and the lower 12 inches is reddish brown channery silt loam. The substratum is reddish brown extremely channery silt loam. It extends to bedrock at a depth of about 25 inches.

Included with these soils in mapping are a few areas of Shouns and Mandy soils, a few areas where stones are on the surface, a few areas where slopes are less than 15 or more than 25 percent, several areas of Rock outcrop, and a few areas of soils that are less than 20 inches deep over bedrock. Included areas make up about 20 percent of this map unit.

The available water capacity of the Belmont soil is high, and permeability is moderate. Natural fertility is high. Runoff is rapid. This soil generally is strongly acid to slightly acid in the surface layer and the upper part of the subsoil, moderately acid to neutral in the lower part of the subsoil, and moderately acid to mildly alkaline in the substratum. Some areas have been limed. The surface layer in these areas is neutral. The rooting depth is 40 inches or more. The depth to bedrock is 40 to 60 inches.

The available water capacity of the Cateache soil is low or moderate, and permeability is moderate. Natural fertility is medium. Runoff is rapid. This soil generally is moderately acid to very strongly acid in the surface layer and subsoil and moderately acid or strongly acid in the substratum. Some areas have been limed. The surface layer in these areas is slightly acid or neutral. The roots of some plants are restricted by bedrock at a depth of 20 to 40 inches.

Most areas of this unit are used for pasture and hay. Other areas are used for woodland.

This unit has limited suitability for cultivated crops. It is better suited to hay and pasture. If cultivated crops are grown, early maturing varieties should be selected for planting. Early frost is common because of the elevation. Erosion is a severe hazard in unprotected areas. Including hay in long-term crop rotations, applying a system of conservation tillage, farming on the contour, growing cover crops and green manure crops, contour stripcropping, returning crop residue to the soil, and establishing grassed waterways for the safe removal of concentrated runoff help to control erosion and maintain tilth.

This unit is suited to hay and pasture. Erosion is a severe hazard if the plant cover is removed by overgrazing. Because of a history of pond failures in areas of this unit, alternative water-supply systems are needed for livestock. A planned grazing system that includes rotational grazing, proper stocking rates, brush management, and cutting of hay at the proper stages of maturity help to control erosion and maintain the desirable species of plants.

A small acreage is wooded. The potential productivity of this unit for trees is moderately high. The slope and slippage moderately or severely limit the operation of logging equipment. Erosion on logging roads and skid trails also is a management concern. It can be controlled by building the roads and trails on the contour. Plant competition is moderate or severe when openings are made in the canopy. Seedling mortality is moderate on south aspects. Red oak, white oak, sugar maple, and black cherry are the dominant species. Black walnut, black locust, and cucumbertree also are common.

The slope is the major limitation on sites for dwellings. Other limitations are the depth to bedrock, especially on sites for dwellings with basements, a moderate shrink-swell potential, and slippage. The dwellings should be designed so that they conform to the natural slope of the land. The less sloping areas are the best sites for dwellings. Land shaping and grading can help to overcome the slope. Extra reinforcement can help footings and foundations to withstand the pressure exerted as the soils swell during wet periods. Also, adding porous backfill adjacent to basement walls helps to reduce this pressure. The deeper included soils may be available for building site development. If not, building above the bedrock and landscaping with additional fill material may be preferable to excavating the hard limestone underlying the Belmont soil. Establishing a plant cover and controlling runoff help to prevent excessive erosion on construction sites.

Low strength, the slope, and slippage are the main limitations on sites for local roads and streets. Providing suitable subgrade or base material can help to prevent the road damage caused by low strength. Building the roads on the contour helps to overcome the slope.

The slope and the depth to bedrock are the main limitations on sites for septic tank absorption fields. The limited depth reduces the capacity of the soils to store effluent from septic tank systems. Excess liquid tends to move laterally downslope and emerge at the surface. The limestone underlying the Belmont soil in some areas is cavernous and can allow the effluent to pollute ground water. The best sites for septic tank absorption fields are the less sloping included soils and the deeper included soils. Installing large absorption fields on the contour results in a more even distribution of effluent.

The capability subclass is IVe.

BeC—Belmont-Cateache silt loams, 3 to 15 percent slopes, stony. These soils are gently sloping to strongly sloping, well drained, and deep and moderately deep. They are on benches and ridgetops in the mountains west of the North Fork of the South Branch of the Potomac River. Stones cover 1 to 3 percent of the surface. Slopes are generally smooth. Outcrops of limestone are in a few areas. This unit is about 50 percent Belmont soil, 30 percent Cateache soil, and 20 percent other soils and Rock outcrop. The Belmont and Cateache soils occur as areas so closely intermingled that it was not practical to map them separately.

Typically, the surface layer of the Belmont soil is dark brown silt loam about 4 inches thick. The subsoil is about 39 inches thick. The upper 10 inches is reddish brown silt loam, and the lower 29 inches is reddish brown silty clay loam. The substratum is reddish brown and dark reddish brown channery silty clay loam. It extends to bedrock at a depth of about 48 inches.

Typically, the surface layer of the Cateache soil is very dark brown silt loam about 3 inches thick. The subsoil is about 18 inches thick. The upper 5 inches is dark reddish brown silt loam, and the lower 13 inches is reddish brown channery silt loam. The substratum is reddish brown extremely channery silt loam. It extends to bedrock at a depth of about 27 inches.

Included with these soils in mapping are a few areas of Shouns and Mandy soils, a few areas of nonstony soils, a few areas where slopes are more than 15 percent, areas of Rock outcrop, and a few areas of soils that are less than 20 inches deep over bedrock. Included areas make up about 20 percent of this map unit.

The available water capacity of the Belmont soil is high, and permeability is moderate. Natural fertility is high. Runoff is medium or rapid. This soil is strongly acid to slightly acid in the surface layer and the upper part of the subsoil, moderately acid to neutral in the lower part of the subsoil, and moderately acid to mildly alkaline in the substratum. The rooting depth is 40 inches or more. The depth to bedrock is 40 to 60 inches.

The available water capacity of the Cateache soil is low or moderate, and permeability is moderate. Natural fertility is medium. Runoff is medium or rapid. This soil is moderately acid to very strongly acid in the surface layer and subsoil and moderately acid or strongly acid in the substratum.

Most areas of this unit are used for woodland. A few areas are used for pasture.

This unit is not suited to cultivated crops. The surface stoniness is the main limitation. Areas that are cleared of stones are suited to hay, but the stones beneath the surface would interfere with cultivation of crops.

This unit is suited to pasture. The stones interfere with clipping. Erosion is a moderate or severe hazard if the plant cover is removed by overgrazing. Because of a history of pond failures in areas of this unit, alternative water-supply systems are needed for livestock. A planned grazing system that includes rotational grazing, proper stocking rates, and brush management help to control erosion and maintain the desirable species of plants.

The potential productivity of this unit for trees is moderately high. Few limitations affect woodland management, but plant competition is moderate or severe when openings are made in the canopy. Erosion on logging roads and skid trails also is a management concern. It can be controlled by building the roads and trails on the contour. Red oak, white oak, sugar maple, and black cherry are the dominant species. Black walnut, black locust, and cucumbertree also are common.

A moderate shrink-swell potential and slopes of more than 8 percent are limitations on sites for dwellings. The depth to bedrock is an additional limitation, especially on sites for dwellings with basements. The stones interfere with the establishment of lawns and with landscaping. The rippable shale underlying the Cateache soil can be excavated more easily than the hard limestone underlying the Belmont soil. The dwellings should be designed so that they conform to the natural slope of the land. The more gently sloping areas are the best sites for dwellings. Extra reinforcement can help footings and foundations to withstand the pressure exerted as the soils swell during wet periods. Also, adding porous backfill adjacent to basement walls helps to reduce this pressure. The deeper included soils may be available for building site development. If not, building above the bedrock and landscaping with additional fill material may be preferable to excavating the hard limestone underlying the Belmont soil. Establishing a plant cover and controlling runoff help to prevent excessive erosion on construction sites.

Low strength, the slope, the shrink-swell potential, and frost action are the main limitations on sites for local roads and streets. Providing suitable subgrade or base material can help to prevent the road damage caused by low strength, shrinking and swelling, and frost action. Building the roads on the contour helps to overcome the slope.

The depth to bedrock and slopes of more than 8 percent are limitations on sites for septic tank absorption fields. The limited depth reduces the capacity of the soils to store effluent from septic tank systems. The limestone underlying the Belmont soil in some areas is cavernous and can allow the effluent to pollute ground water. The deeper included soils may be available for use as sites for septic tank absorption fields. The less sloping areas are the best sites for these fields. Installing the absorption fields on the contour results in a more even distribution of effluent.

The capability subclass is VIs.

BeE—Belmont-Cateache silt loams, 15 to 35 percent slopes, stony. These soils are moderately steep to steep, well drained, and deep and moderately deep. They are on hillsides in the mountains west of the North Fork of the South Branch of the Potomac River. Stones cover 1 to 3 percent of the surface. Slopes commonly are dissected by drainageways. Outcrops of limestone are common. This unit is about 50 percent Belmont soil, 30 percent Cateache soil, and 20 percent other soils and Rock outcrop. The Belmont and Cateache soils occur as areas so closely intermingled that it was not practical to map them separately.

Typically, the surface layer of the Belmont soil is dark brown silt loam about 4 inches thick. The subsoil is about 38 inches thick. The upper 9 inches is reddish brown silt loam, and the lower 29 inches is reddish brown silty clay loam. The substratum is reddish brown and dark reddish brown channery silty clay loam. It extends to bedrock at a depth of about 47 inches.

Typically, the surface layer of the Cateache soil is very dark brown silt loam about 3 inches thick. The subsoil is about 17 inches thick. The upper 5 inches is dark reddish brown silt loam, and the lower 12 inches is reddish brown channery silt loam. The substratum is reddish brown extremely channery silt loam. It extends to bedrock at a depth of about 25 inches.

Included with these soils in mapping are a few areas of Shouns and Mandy soils, a few areas of nonstony soils, a few areas where stones cover more than 3 percent of the surface, a few areas where slopes are less than 15 or more than 35 percent, areas of Rock outcrop, and a few areas of soils that are less than 20 inches deep over bedrock. Included areas make up about 20 percent of this map unit.

The available water capacity of the Belmont soil is high, and permeability is moderate. Natural fertility is high. Runoff is rapid or very rapid. This soil is strongly acid to slightly acid in the surface layer and the upper part of the subsoil, moderately acid to neutral in the lower part of the subsoil, and moderately acid to mildly alkaline in the substratum. The rooting depth is 40 inches or more. The depth to bedrock is 40 to 60 inches.

The available water capacity of the Cateache soil is low or moderate, and permeability is moderate. Natural fertility is medium. Runoff is rapid or very rapid. This soil is moderately acid to very strongly acid in the surface layer and subsoil and moderately acid or strongly acid in the substratum. The roots of some plants are restricted by bedrock at a depth of 20 to 40 inches.

Most areas of this unit are used for woodland. A few areas are used for pasture.

This unit is not suited to cultivated crops. The surface stoniness and the slope are the main limitations. The more gently sloping areas that are cleared of stones are suited to hay, but the stones beneath the surface would interfere with cultivation of crops.

This unit cannot be easily managed for pasture. The slope is the main limitation. The surface stoniness also is a limitation. Operating the conventional equipment used in clipping and in applying fertilizer is unsafe in the steeper areas. Erosion is a severe hazard if the plant cover is removed by overgrazing. Because of a history of pond failures in areas of this unit, alternative water-supply systems are needed for livestock. A planned grazing system that includes rotational grazing, proper stocking rates, and brush management help to control erosion and maintain the desirable species of plants.

The potential productivity of this unit for trees is moderately high. The slope and slippage limit the use of equipment. Erosion on logging roads and skid trails also is a management concern. It can be controlled by building the roads and trails on the contour. Plant competition is severe or moderate when openings are made in the canopy. Seedling mortality is a management concern on south aspects. Red oak, white oak, sugar maple, and black cherry are the dominant species. Black walnut, black locust, and cucumbertree also are common.

The slope of both soils, low strength in the Belmont soil, and slippage and the depth to bedrock in areas of the Cateache soil are the main limitations affecting most urban uses. A soil that is better suited to these uses should be considered.

The capability subclass is VIIs.

BeF—Belmont-Cateache silt loams, 35 to 55 percent slopes, stony. These soils are very steep, well drained, and deep and moderately deep. They are on hillsides in the mountains west of the North Fork of the South Branch of the Potomac River. Stones cover 1 to 3 percent of the surface. Slopes commonly are dissected by drainageways. Outcrops of limestone are common. This unit is about 50 percent Belmont soil, 30 percent Cateache soil, and 20 percent other soils and Rock outcrop. The Belmont and Cateache soils occur as areas so closely intermingled that it was not practical to map them separately.

Typically, the surface layer of the Belmont soil is dark brown silt loam about 3 inches thick. The subsoil is about 37 inches thick. The upper 9 inches is reddish brown silt loam, and the lower 28 inches is reddish brown silty clay loam. The substratum is reddish brown and dark reddish brown channery silty clay loam. It extends to bedrock at a depth of about 46 inches.

Typically, the surface layer of the Cateache soil is very dark brown silt loam about 2 inches thick. The subsoil is about 18 inches thick. The upper 6 inches is dark reddish brown silt loam, and the lower 12 inches is reddish brown channery silt loam. The substratum is reddish brown extremely channery silt loam. It extends to bedrock at a depth of about 24 inches.

Included with these soils in mapping are a few areas of Shouns and Mandy soils, a few areas of soils where stones cover more than 3 percent of the surface, a few areas where slopes are less than 35 or more than 55 percent, areas of Rock outcrop, and a few areas of soils that are less than 20 inches deep over bedrock. Included areas make up about 20 percent of this map unit.

The available water capacity of the Belmont soil is high, and permeability is moderate. Natural fertility is high. Runoff is very rapid. This soil is strongly acid to slightly acid in the surface layer and the upper part of the subsoil, moderately acid to neutral in the lower part of the subsoil, and moderately acid to mildly alkaline in the substratum. The rooting depth is 40 inches or more. The depth to bedrock is 40 to 60 inches.

The available water capacity of the Cateache soil is low or moderate, and permeability is moderate. Natural fertility is medium. Runoff is very rapid. This soil is moderately acid to very strongly acid in the surface layer and subsoil and moderately acid or strongly acid in the substratum. The roots of some plants are restricted by bedrock at a depth of 20 to 40 inches.

Most areas of this unit are used for woodland. A few areas are used for pasture.

This unit is not suited to cultivated crops or hay. The slope prevents the safe operation of conventional farm equipment.

This unit cannot be easily managed for pasture. The slope prevents the safe operation of the conventional equipment used in clipping and in applying fertilizer. The hazard of erosion is very severe in unprotected areas.

The potential productivity of this unit for trees is moderately high. The slope prevents the safe operation of equipment. Slippage is a hazard. Erosion on logging roads and skid trails also is a management concern. It can be controlled by building the roads and trails on the contour. Plant competition is severe or moderate when openings are made in the canopy. Seedling mortality is a management concern on south aspects. Red oak, white oak, sugar maple, and black cherry are the dominant species. Black walnut, black locust, and cucumbertree also are common.

The slope of both soils, low strength in the Belmont soil, and slippage and the depth to bedrock in areas of the Cateache soil are the main limitations affecting most urban uses. A soil that is better suited to these uses should be considered.

The capability subclass is VIIs.

BeG—Belmont-Cateache silt loams, 55 to 80 percent slopes, stony. These soils are extremely steep, well drained, and deep and moderately deep. They are on hillsides in the mountains west of the North Fork of the South Branch of the Potomac River. This unit was delineated only on maps of land managed by the United States Department of Agriculture, Forest Service, or adjacent private land. On most of the private land, it is included in unit BeF. Stones cover 1 to 3 percent of the surface. Slopes commonly are dissected by drainageways. Outcrops of limestone and shale are common. This unit is about 50 percent Belmont soil, 30 percent Cateache soil, and 20 percent other soils and Rock outcrop. The Belmont and Cateache soils occur as areas so closely intermingled that it was not practical to map them separately.

Typically, the surface layer of the Belmont soil is dark brown silt loam about 2 inches thick. The subsoil is about 36 inches thick. The upper 8 inches is reddish brown silt loam, and the lower 28 inches is reddish brown silty clay loam. The substratum is reddish brown and dark reddish brown channery silty clay loam. It extends to bedrock at a depth of about 45 inches.

Typically, the surface layer of the Cateache soil is very dark brown silt loam about 2 inches thick. The subsoil is about 18 inches thick. The upper 6 inches is dark reddish brown silt loam, and the lower 12 inches is reddish brown channery silt loam. The substratum is reddish brown extremely channery silt loam. It extends to bedrock at a depth of about 23 inches.

Included with these soils in mapping are a few areas of Shouns soils, a few areas of soils where stones cover more than 3 percent of the surface, a few areas where slopes are less than 55 percent, areas of Rock outcrop, and a few areas of soils that are less than 20 inches deep over bedrock. Included areas make up about 20 percent of this map unit.

The available water capacity of the Belmont soil is high, and permeability is moderate. Natural fertility is high. Runoff is very rapid. This soil is strongly acid to slightly acid in the surface layer and the upper part of the subsoil, moderately acid to neutral in the lower part of the subsoil, and moderately acid to mildly alkaline in the substratum. The rooting depth is 40 inches or more. The depth to bedrock is 40 to 60 inches.

The available water capacity of the Cateache soil is low or moderate, and permeability is moderate. Natural fertility is medium. Runoff is very rapid. This soil is moderately acid to very strongly acid in the surface layer and subsoil and moderately acid or strongly acid in the substratum. The roots of some plants are restricted by bedrock at a depth of 20 to 40 inches.

This unit is used almost exclusively for woodland. It is not suited to cultivated crops, hay, or pasture. The slope prevents the use of conventional farm equipment. The hazard of erosion is very severe in unprotected areas.

The potential productivity of this unit for trees is moderately high. The slope is the main limitation. Operating conventional harvesting equipment is unsafe on these extremely steep soils. Alternative methods of logging, such as cable logging, are needed. Slippage is a hazard. Construction of logging roads and skid trails is not recommended because of the hazard of erosion and the unsafe operating conditions. Plant competition is severe or moderate when openings are made in the canopy. Seedling mortality is a management concern on south aspects. Red oak, white oak, sugar maple, and black cherry are the dominant species. Black locust and cucumbertree also are common.

The slope prohibits the use of this unit for dwellings, sanitary facilities, and local roads and streets. Slippage and the depth to bedrock in areas of the Cateache soil and low strength in the Belmont soil are additional limitations.

The capability subclass is VIIs.

BkC—Berks channery silt loam, 8 to 15 percent slopes. This soil is moderately deep, strongly sloping, and well drained. It is on smooth, narrow ridgetops and benches.

Typically, the surface layer is dark brown channery silt loam about 7 inches thick. The subsoil is about 16 inches thick. The upper 10 inches is brownish yellow channery and very channery silt loam, and the lower 6 inches is strong brown extremely channery silt loam. The substratum is strong brown extremely channery silt loam. It extends to bedrock at a depth of about 34 inches.

Included with this soil in mapping are small areas of Calvin, Clarksburg, Dekalb, Edom, Ernest, Lehew, and Weikert soils and some areas where stones are on the surface. Also included are areas where slopes are less than 8 or more than 15 percent, a few areas of deep soils, and a few areas where the topsoil has been removed by erosion. Included soils make up about 25 percent of this map unit.

The Berks soil has a very low to moderate available water capacity. It is droughty. Permeability is moderate or moderately rapid. Runoff is rapid. Natural fertility is low. This soil generally is strongly acid or very strongly acid. Many areas have been limed. The surface layer in these areas is moderately acid to neutral. The roots of some plants are restricted by bedrock at a depth of 20 to 40 inches.

Most areas of this soil are used for pasture. Some areas are used for hay, and a few areas are used for cultivated crops or woodland.

This soil is suited to cultivated crops, but it is droughty. It is better suited to early maturing small grain than to late maturing crops, such as corn. Erosion is a severe hazard in unprotected areas. Including hay in the crop rotation, applying a system of conservation tillage, farming on the contour, growing cover crops and green manure crops, returning crop residue to the soil, and establishing grassed waterways for the safe removal of concentrated runoff help to control erosion and maintain tilth. A system of conservation tillage that leaves plant residue on the surface conserves moisture in this droughty soil.

This soil is suited to hay and pasture, but the droughtiness limits forage production during midsummer. Erosion is a severe hazard if the plant cover is removed by overgrazing. Water for livestock is scarce on this droughty soil, but pond sites and potential spring development sites commonly are available along nearby drainageways. A planned grazing system that includes rotational grazing, proper stocking rates, brush management, and cutting of hay at the proper stages of maturity help to control erosion and maintain the desirable species of plants.

The potential productivity of this soil for trees is moderate. The depth to bedrock, the low natural fertility, and the droughtiness restrict tree growth. Seedling mortality and plant competition are limitations on this droughty soil. Erosion on logging roads and skid trails also is a management concern. It can be controlled by building the roads and trails on the contour. Chestnut oak, Virginia pine, red oak, black oak, and white oak are the dominant species.

The slope is a moderate limitation on sites for dwellings. The bedrock can interfere with excavation for basements, but in most areas it is soft enough to be excavated with conventional earth-moving equipment. The dwellings should be designed so that they conform to the natural slope of the land. The more gently sloping included areas commonly are available for building site development. Establishing a plant cover and controlling runoff help to prevent excessive erosion on construction sites.

The slope is the main limitation on sites for local roads and streets. Building the roads and streets on the contour helps to overcome this limitation. The bedrock commonly is encountered during road construction. It generally can be ripped with earth-moving equipment. Maintaining vegetation on roadbanks is difficult on this droughty soil. Drought-tolerate species, such as tall fescue and crownvetch, should be selected for planting.

The depth to bedrock is the main limitation on sites for septic tank absorption fields. The slope also is a limitation. In a few areas the deeper included soils are available for use as sites for septic tank absorption fields. The more gently sloping areas are the best sites for these fields. Installing large absorption fields on the contour results in a more even distribution of effluent over a large area.

The capability subclass is IIIe.

BkD—Berks channery silt loam, 15 to 25 percent slopes. This soil is moderately deep, moderately steep, and well drained. It is on ridgetops, benches, and hillsides throughout the eastern three-fourths of the county. The benches and hillsides commonly are dissected by drainageways.

Typically, the surface layer is about 6 inches thick. The upper 2 inches is dark grayish brown channery silt loam, and the lower 4 inches is yellowish brown channery silt loam. The subsoil is about 16 inches thick. The upper 10 inches is brownish yellow channery and very channery silt loam, and the lower 6 inches is strong brown extremely channery silt loam. The substratum is strong brown extremely channery silt loam. It extends to bedrock at a depth of about 35 inches.

Included with this soil in mapping are small areas of Calvin, Clarksburg, Dekalb, Edom, Ernest, Lehew, and Weikert soils and some areas where stones are on the surface. Also included are a few areas where slopes are less than 15 or more than 25 percent. Included soils make up about 25 percent of this map unit.

The Berks soil has a very low to moderate available water capacity. It is droughty. Permeability is moderate or moderately rapid. Runoff is rapid. Natural fertility is low. This soil generally is strongly acid or very strongly acid. Some areas have been limed. The surface layer in these areas is moderately acid to neutral. The roots of some plants are restricted by bedrock at a depth of 20 to 40 inches.

Most areas of this soil are used for woodland or are reverting back to woody species. Some areas are used for pasture, and a few areas are used for hay.

This soil has limited suitability for cultivated crops because of the droughtiness and slope. If these crops are grown, this soil is better suited to early maturing small grain than to late maturing crops, such as corn. Erosion is a severe hazard in unprotected areas. Including hay in the long-term crop rotations, applying a system of conservation tillage, farming on the contour, growing cover crops and green manure crops, contour stripcropping, returning crop residue to the soil, and establishing grassed waterways for the safe removal of concentrated runoff help to control erosion and maintain tilth. A system of conservation tillage that leaves plant residue on the surface conserves moisture in this droughty soil.

This soil is suited to hay and pasture, but the droughtiness limits forage production during midsummer. Erosion is a severe hazard if the plant cover is removed by overgrazing. Water for livestock is scarce on this soil, but pond sites and potential spring development sites commonly are available along nearby drainageways. A planned grazing system that includes rotational grazing, proper stocking rates, brush management, and cutting of hay at the proper stages of maturity help to control erosion and maintain the desirable species of plants.

The potential productivity of this soil for trees is moderate. The depth to bedrock, the low natural fertility, and the droughtiness limit tree growth. The slope is a moderate limitation for equipment. Seedling mortality also is a limitation on this droughty soil. Plant competition is a limitation when openings are made in the canopy. Erosion on logging roads and skid trails also is a management concern. It can be controlled by building the roads and trails on the contour. Chestnut oak, Virginia pine, red oak, black oak, and white oak are the dominant species.

The slope is the main limitation on sites for dwellings. The bedrock also can interfere with excavation for basements, but in most areas it is soft enough to be excavated with conventional earth-moving equipment. The dwellings should be designed so that they conform to the natural slope of the land. The less sloping areas are the best sites for dwellings. Land shaping and grading can help to overcome the slope. Establishing a plant cover and controlling runoff help to prevent excessive erosion on construction sites.

The slope is the main limitation on sites for local roads and streets. Building the roads and streets on the contour helps to overcome this limitation. The bedrock commonly is encountered during road construction. It generally can be ripped with earth-moving equipment. Maintaining vegetation on roadbanks is difficult on this droughty soil. Drought-tolerant species, such as tall fescue and crownvetch, should be selected for planting.

The depth to bedrock and the slope are limitations on sites for septic tank absorption fields. In a few areas the deeper included soils are available for use as sites for septic tank absorption fields. The less sloping areas are the best sites for these fields. Installing large absorption fields on the contour results in a more even distribution of effluent over a large area.

The capability subclass is IVe.

BkE—Berks channery silt loam, 25 to 35 percent slopes. This soil is moderately deep, steep, and well drained. It is on hillsides in the eastern three-fourths of the county. The hillsides commonly are dissected by drainageways.

Typically, the surface layer is about 4 inches thick. The upper 1 inch is dark grayish brown channery silt loam, and the lower 3 inches is yellowish brown channery silt loam. The subsoil is about 18 inches thick. The upper 11 inches is brownish yellow channery and very channery silt loam, and the lower 7 inches is strong brown extremely channery silt loam. The substratum is strong brown extremely channery silt loam. It extends to bedrock at a depth of about 36 inches.

Included with this soil in mapping are small areas of Calvin, Dekalb, Edom, Lehew, and Weikert soils. Also included are several areas where stones are on the surface, a few areas of deep colluvial soils, and some areas where slopes are less than 25 or more than 35 percent. Included soils make up about 25 percent of this map unit.

The Berks soil has a very low to moderate available water capacity. It is droughty. Permeability is moderate or moderately rapid. Runoff is very rapid. Natural fertility is low. This soil is strongly acid or very strongly acid. The roots of some plants are restricted by bedrock at a depth of 20 to 40 inches.

Most areas of this soil are used for woodland. A few areas are used for pasture.

This soil is not suited to cultivated crops or hay. The slope limits the safe use of conventional farm equipment. The hazard of erosion is very severe in unprotected areas.

The soil is suited to pasture, but the droughtiness limits forage production during midsummer. Erosion is a very severe hazard if the plant cover is removed by overgrazing. The slope also limits the safe use of the conventional equipment used in clipping. Water for livestock is scarce on this soil, but pond sites and potential spring development sites commonly are available along nearby drainageways. A planned grazing system that includes rotational grazing, proper stocking rates, and brush management help to control erosion and maintain the desirable species of plants.

The potential productivity of this soil for trees is moderate. The depth to bedrock, the low natural fertility, and the droughtiness limit tree growth. The slope is a moderate limitation for equipment. Seedling mortality also is a limitation on this droughty soil. Plant competition is a limitation when openings are made in the canopy. Erosion on logging roads and skid trails also is a management concern. It can be controlled by building the roads and trails on the contour. Chestnut oak, Virginia pine, red oak, black oak, and white oak are the dominant species.

The slope and the depth to bedrock are the main limitations affecting most urban uses. A soil that is better suited to these uses should be considered.

The capability subclass is VIe.

BkF—Berks channery silt loam, 35 to 55 percent slopes. This soil is very steep, moderately deep, and well drained. It is on hillsides in the eastern three-fourths of the county. The hillsides commonly are dissected by drainageways.

Typically, the surface layer is about 5 inches thick. The upper 1 inch is dark grayish brown channery silt loam, and the lower 4 inches is yellowish brown channery silt loam. The subsoil is about 18 inches thick. The upper 11 inches is brownish yellow channery and very channery silt loam, and the lower 7 inches is strong brown extremely channery silt loam. The substratum is strong brown extremely channery silt loam. It extends to bedrock at a depth of about 37 inches.

Included with this soil in mapping are small areas of Calvin, Dekalb, Lehew, and Weikert soils. Also included are small areas of deeper soils, small areas where stones are on the surface, a few areas of colluvial soils, and a few areas where slopes are more than 55 percent. Included soils make up about 25 percent of this map unit.

The Berks soil has a very low to moderate available water capacity. It is droughty. Permeability is moderate to moderately rapid. Runoff is very rapid. Natural fertility is low. This soil is strongly acid or very strongly acid. The roots of some plants are restricted by bedrock at a depth of 20 to 40 inches.

Most areas of this soil are used as woodland. A few areas are used for pasture.

This soil is not suited to cultivated crops or hay. The slope limits the safe use of conventional farm equipment. Also, erosion is a very severe hazard in unprotected areas.

This soil cannot be easily managed for pasture. The slope prevents the safe operation of the conventional equipment used in clipping and in applying fertilizer. The hazard of erosion is very severe if the plant cover is removed by overgrazing.

The potential productivity of this soil for trees is moderate. The depth to bedrock, the low natural fertility, and the droughtiness limit tree growth. The slope prevents the safe operation of logging equipment. Seedling mortality is a limitation on this droughty soil. Erosion on logging roads and skid trails also is a management concern. It can be controlled by building the roads and trails on the contour. Plant competition is a limitation when openings are made in the canopy. Chestnut oak, Virginia pine, red oak, black oak, and white oak are the dominant species.

The slope and the depth to bedrock are the main limitations affecting most urban uses. A soil that is better suited to these uses should be considered.

The capability subclass is VIIe.

BmE—Berks channery loam, 15 to 35 percent slopes, stony. This soil is moderately deep, steep or moderately steep, and well drained. Stones cover 1 to 3 percent of the surface. Outcrops of rock are common in some areas. This soil is on hillsides on Shenandoah Mountain and immediately east of the Fore Knobs. These hillsides commonly are dissected by drainageways.

Typically, the surface layer is about 5 inches thick. The upper 2 inches is dark grayish brown channery loam, and the lower 3 inches is yellowish brown channery loam. The subsoil is about 14 inches thick. The upper 8 inches is brownish yellow channery and very channery silt loam, and the lower 6 inches is strong brown extremely channery silt loam. The substratum is strong brown extremely channery silt loam. It extends to bedrock at a depth of about 36 inches.

Included with this soil in mapping are small areas of Calvin, Dekalb, Lehew, and Weikert soils. Also included are small areas of deep soils, small areas where stones cover more than 3 percent of the surface, a few areas of colluvial soils, areas of Rock outcrop, and a few areas where slopes are less than 15 or more than 35 percent. Included soils and Rock outcrop make up about 25 percent of this map unit.

The Berks soil has a very low to moderate available water capacity. It is droughty. Permeability is moderate or moderately rapid. Runoff is rapid or very rapid. Natural fertility is low. This soil is strongly acid or very strongly acid. The roots of some plants are restricted by bedrock at a depth of 20 to 40 inches.

Most areas of this soil are used for woodland. A few areas are used for pasture.

This soil is not suited to cultivated crops. The slope is too steep for the use of conventional farm machinery. The surface stoniness also is a limitation. The less sloping areas that are cleared of stones are suited to hay, but the stones beneath the surface would interfere with cultivation of crops.

This soil cannot be easily managed for pasture. The slope is the main limitation. The surface stoniness also is a limitation. Operating the conventional equipment used in clipping and in applying fertilizer is unsafe in the steeper areas. Erosion is a severe hazard if the plant cover is removed by overgrazing. The droughtiness limits forage production during midsummer. Water for livestock is scarce on this soil, but pond sites and potential spring development sites commonly are available along nearby drainageways. A planned grazing system that includes rotational grazing, proper stocking rates, and brush management help to control erosion and maintain the desirable species of plants.

The potential productivity of this soil for trees is moderate. The depth to bedrock, the low natural fertility, and the droughtiness restrict tree growth. The slope prevents the safe operation of some equipment. Seedling mortality also is a limitation on this droughty soil. Plant competition is a limitation when openings are made in the canopy. Erosion on logging roads and skid trails also is a management concern. It can be controlled by building the roads and trails on the contour. Chestnut oak, Virginia pine, red oak, black oak, and white oak are the dominant species.

The slope and the depth to bedrock are the main limitations affecting most urban uses. A soil that is better suited to these uses should be considered.

The capability subclass is VIIs.

BmF—Berks channery loam, 35 to 55 percent slopes, stony. This soil is moderately deep, very steep, and well drained. Stones cover 1 to 3 percent of the surface. Outcrops of rock are common in some areas. This soil is on hillsides on Shenandoah Mountain and immediately east of the Fore Knobs. These hillsides commonly are dissected by drainageways.

Typically, the surface layer is about 4 inches thick. The upper 1 inch is dark grayish brown channery loam, and the lower 3 inches is yellowish brown channery loam. The subsoil is about 14 inches thick. The upper 8 inches is brownish yellow channery and very channery silt loam, and the lower 6 inches is strong brown extremely channery silt loam. The substratum is strong brown extremely channery silt loam. It extends to bedrock at a depth of about 37 inches.

Included with this soil in mapping are small areas of Calvin, Dekalb, Lehew, and Weikert soils. Also included are small areas of deep soils, small areas where stones cover more than 3 percent of the surface, a few areas of colluvial soils, areas of Rock outcrop, and a few areas where slopes are less than 35 or more than 55 percent. Included soils and Rock outcrop make up about 25 percent of this map unit.

The Berks soil has a very low to moderate available water capacity. It is droughty. Permeability is moderate or moderately rapid. Runoff is very rapid. Natural fertility is low. This soil is strongly acid or very strongly acid. The roots of some plants are restricted by bedrock at a depth of 20 to 40 inches.

Most areas of this soil are used for woodland.

This soil is not suited to cultivated crops or hay, and it cannot be easily managed for pasture. The slope is too steep for the use of conventional farm machinery. The surface stoniness also is a limitation.

The potential productivity of this soil for trees is moderate. The depth to bedrock, the low natural fertility, and the droughtiness restrict tree growth. The slope prevents the safe operation of some equipment. Erosion on logging roads and skid trails also is a management concern. It can be controlled by building the roads and trails on the contour. The seedling mortality rate is moderate in areas that are replanted. Plant competition is a limitation when openings are made in the canopy. Chestnut oak, Virginia pine, red oak, black oak, and white oak are the dominant species.

The slope and the depth to bedrock are the main limitations affecting most urban uses. A soil that is better suited to these uses should be considered.

The capability subclass is VIIs.

BmG—Berks channery loam, 55 to 80 percent slopes, stony. This soil is moderately deep, extremely steep, and well drained. Stones cover 1 to 3 percent of the surface. Outcrops of rock are common in some areas. This soil is on hillsides on Shenandoah Mountain and immediately east of the Fore Knobs. These hillsides commonly are dissected by drainageways. This unit was delineated only on maps of land managed by the United States Department of Agriculture, Forest Service, or adjacent private land. On most of the private land, this soil is included in unit BmF.

Typically, the surface layer is about 4 inches thick. The upper 1 inch is dark grayish brown channery loam, and the lower 3 inches is yellowish brown channery loam. The subsoil is about 14 inches thick. The upper 8 inches is brownish yellow channery and very channery silt loam, and the lower 6 inches is strong brown extremely channery silt loam. The substratum is strong brown extremely channery silt loam. It extends to bedrock at a depth of about 21 inches.

Included with this soil in mapping are small areas of Calvin, Dekalb, Lehew, and Weikert soils. Also included are small areas of deeper soils, small areas where stones cover more than 3 percent of the surface, areas of Rock outcrop, and a few areas where slopes are less than 55 percent. Included soils and Rock outcrop make up about 25 percent of this map unit.

The Berks soil has a very low to moderate available water capacity. It is droughty. Permeability is moderate or moderately rapid. Runoff is very rapid. Natural fertility is low. This soil is strongly acid or very strongly acid. The roots of some plants are restricted by bedrock at a depth of 20 to 40 inches.

This soil is used almost exclusively for woodland. It is not suited to cultivated crops, hay, or pasture. The slope prevents the use of conventional farm equipment. The hazard of erosion is very severe.

The potential productivity of this soil for trees is moderate. The limited depth to bedrock, the low natural fertility, and the droughtiness restrict tree growth. The slope is a severe limitation. Operating conventional harvesting equipment is unsafe on this soil. Alternative methods of logging, such as cable logging, are needed. Construction of logging roads and skid trails are not recommended because of the hazard of erosion and the unsafe operating conditions. Plant competition is a limitation when openings are made in the canopy. Seedling mortality also is a limitation on this droughty soil in areas that are replanted. Chestnut oak, Virginia oak, red oak, black oak, and white oak are the dominant species.

The extremely steep slopes prohibit the use of this soil for dwellings, sanitary facilities, and local roads and streets. The depth to bedrock also is a limitation.

The capability subclass is VIIs.

BnC—Berks-Weikert channery silt loams, 8 to 15 percent slopes. These strongly sloping, well drained, moderately deep and shallow soils are on ridgetops and benches. They are scattered throughout the eastern three-fourths of the county. Slopes are generally smooth. This unit is about 45 percent Berks soil, 35 percent Weikert soil, and 20 percent other soils. The Berks and Weikert soils occur as areas so closely intermingled that it was not practical to map them separately.

Typically, the surface layer of the Berks soil is dark brown channery silt loam about 6 inches thick. The subsoil is about 16 inches thick. The upper 10 inches is brownish yellow channery and very channery silt loam, and the lower 6 inches is strong brown extremely channery silt loam. The substratum is strong brown extremely channery silt loam. It extends to bedrock at a depth of about 33 inches.

Typically, the surface layer of the Weikert soil is dark brown channery silt loam about 5 inches thick. The subsoil is brownish yellow very channery silt loam about 5 inches thick. The substratum is brownish yellow extremely channery silt loam. It extends to bedrock at a depth of about 12 inches.

Included with these soils in mapping are a few areas of Edom soils, a few areas where slopes are less than 8 or more than 15 percent, a few areas of moderately well drained soils, a few areas of deep soils, a few areas of soils that have a red subsoil, and a few areas where the topsoil has been removed by erosion. Included areas make up about 20 percent of this map unit.

The available water capacity of the Berks soil is very low to moderate, and that of the Weikert soil is very low. Both soils are droughty. Permeability is moderate or moderately rapid in the Berks soil and moderately rapid in the Weikert soil. Runoff is rapid on both soils. Natural fertility is low. Both soils generally are strongly acid or very strongly acid. Many areas have been limed. The surface layer in these areas is moderately acid to neutral. The roots of some plants are restricted by bedrock at a depth of 20 to 40 inches in the Berks soil and 10 to 20 inches in the Weikert soil.

Most areas of this unit are used for pasture and hay. Some areas are used for cultivated crops or woodland.

Because these soils are droughty, they have limited suitability for cultivated crops. If cultivated crops are grown, the soils are better suited to early maturing small grain than to late maturing crops, such as corn. Erosion is a severe hazard in unprotected areas. Including hay in the long-term crop rotations, applying a system of conservation tillage, farming on the contour, growing cover crops and green manure crops, contour stripcropping, returning crop residue to the soils, and establishing grassed waterways for the safe removal of concentrated runoff help to control erosion and maintain tilth. A system of conservation tillage that leaves plant residue on the surface conserves moisture in these droughty soils.

These soils are suited to hay and pasture, but the droughtiness limits forage production during midsummer. Erosion is a severe hazard if the plant cover is removed by overgrazing. Water for livestock is scarce on this unit, but pond sites and potential spring development sites commonly are available along nearby drainageways. A planned grazing system that includes rotational grazing, proper stocking rates, brush management, and cutting of hay at the proper stages of maturity help to control erosion and maintain the desirable species of plants.

The potential productivity of these soils for trees is moderate. The limited depth to bedrock, the low natural fertility, and the droughtiness restrict tree growth. Seedling mortality also is a limitation on these soils. Plant competition is slight or moderate when openings are made in the canopy. Erosion on logging roads and skid trails also is a management concern. It can be controlled by building the roads and trails on the contour. Chestnut oak, Virginia pine, red oak, black oak, and white oak are the dominant species.

The slope and the depth to bedrock are the main limitations on sites for dwellings. In most areas the bedrock is soft enough to be excavated with conventional earth-moving equipment. The dwellings should be designed so that they conform to the natural slope of the land. The gently sloping included areas commonly are available for building site development. Establishing a plant cover and controlling runoff help to prevent excessive erosion on construction sites.

The slope is the main limitation on sites for local roads and streets. Building the roads and streets on the contour helps to overcome this limitation. The bedrock commonly is encountered during road construction. It generally can be ripped with earth-moving equipment.

Maintaining vegetation on roadbanks is difficult on these droughty soils. Drought-tolerant species, such as tall fescue and crownvetch, should be selected for planting.

The depth to bedrock is the main limitation on sites for septic tank absorption fields. The slope also is a limitation. In a few areas the deeper included soils are available for use as sites for septic tank absorption fields. The gently sloping areas are the best sites for these fields. Installing large absorption fields on the contour results in a more even distribution of effluent over a large area.

The capability subclass is IVe.

BnD—Berks-Weikert channery silt loams, 15 to 25 percent slopes. These moderately steep, well drained, moderately deep and shallow soils are on ridgetops, benches, and hillsides. The benches and hillsides commonly are dissected by drainageways. This unit is scattered throughout the eastern three-fourths of the county. It is about 50 percent Berks soil, 30 percent Weikert soil, and 20 percent other soils. The Berks and Weikert soils occur as areas so closely intermingled that it was not practical to map them separately.

Typically, the surface layer of the Berks soil is dark brown channery silt loam about 6 inches thick. The subsoil is about 17 inches thick. The upper 11 inches is brownish yellow channery and very channery silt loam, and the lower 6 inches is strong brown extremely channery silt loam. The substratum is strong brown extremely channery silt loam. It extends to bedrock at a depth of about 34 inches.

Typically, the surface layer of the Weikert soil is dark brown channery silt loam about 5 inches thick. The subsoil is brownish yellow very channery silt loam about 5 inches thick. The substratum is brownish yellow extremely channery silt loam. It extends to bedrock at a depth of about 13 inches.

Included with this soil in mapping are a few areas of Edom soils, a few areas where slopes are less than 15 or more than 25 percent, and a few areas of Rock outcrop. Also included are a few areas where the topsoil has been removed by erosion, a few areas of moderately well drained soils, a few areas of deeper soils, and a few areas of soils that have a red subsoil. Included areas make up about 20 percent of this map unit.

The available water capacity of the Berks soil is very low to moderate, and that of the Weikert soil is very low. Both soils are droughty. Permeability is moderate or moderately rapid in the Berks soil and moderately rapid in the Weikert soil. Runoff is rapid on both soils. Natural fertility is low. These soils generally are strongly acid or very strongly acid. Some areas have been limed. The surface layer in these areas is moderately acid to neutral. The roots of some plants are restricted by bedrock at a depth of 20 to 40 inches in the Berks soil and 10 to 20 inches in the Weikert soil.

Most areas of these soils are used for pasture and hay. Other areas are wooded.

This unit is not suited to cultivated crops. The main management concern is low production because of the depth to bedrock, the low natural fertility, and the very low or low available water capacity. Erosion also is a severe hazard in unprotected areas.

This unit is suited to pasture and hay, but the droughtiness limits forage production during midsummer. Erosion is a severe hazard if the plant cover is removed by overgrazing. Water for livestock is scarce on this unit, but pond sites and potential spring development sites commonly are available along nearby drainageways. A planned grazing system that includes rotational grazing, proper stocking rates, brush management, and cutting of hay at the proper stages of maturity help to control erosion and maintain the desirable species of plants.

The potential productivity of this unit for trees is moderate. The depth to bedrock, the low natural fertility, and the droughtiness restrict tree growth. The slope moderately limits the use of equipment. Seedling mortality also is a limitation on these droughty soils. Plant competition is slight to moderate when openings are made in the canopy. Erosion on logging roads and skid trails also is a management concern. It can be controlled by building the roads and trails on the contour. Chestnut oak, Virginia pine, red oak, black oak, and white oak are the dominant species.

The slope and the depth to bedrock are the main limitations on sites for dwellings. In most areas the bedrock is soft enough to be excavated with conventional earth-moving equipment. The dwellings should be designed so that they conform to the natural slope of the land. The less sloping areas are the best sites for dwellings. Land shaping and grading can help to overcome the slope. Establishing a plant cover and controlling runoff help to prevent excessive erosion on construction sites.

The slope is the main limitation on sites for local roads and streets. Building the roads and streets on the contour helps to overcome this limitation. The bedrock commonly is encountered during road construction. It generally can be ripped with earth-moving equipment. Maintaining vegetation on roadbanks is difficult on these droughty soils. Drought-tolerant species, such as tall fescue and crownvetch, should be selected for planting.

The slope and the depth to bedrock are limitations on sites for septic tank absorption fields. The less sloping included areas are the best sites for these fields. The deeper included soils may be available as sites for septic tank absorption fields. Installing large absorption fields on the contour results in a more even distribution of effluent over a large area.

The capability subclass is VIe.

BnD3—Berks-Weikert channery silt loams, 15 to 25 percent slopes, severely eroded. These moderately steep, well drained, moderately deep and shallow soils are on ridgetops, benches, and hillsides. Erosion has removed most of the original topsoil, and the subsoil is exposed in places. In some places these soils are gullied. The benches and hillsides commonly are dissected by drainageways. This unit is mainly on the western side of North Fork Mountain. It is about 40 percent Berks soil, 40 percent Weikert soil, and 20 percent other soils. The Berks and Weikert soils occur as areas so closely intermingled that it was not practical to map them separately.

Typically, the surface layer of the Berks soil is brown channery silt loam about 3 inches thick. The subsoil is about 16 inches thick. The upper 10 inches is brownish yellow channery and very channery silt loam, and the lower 6 inches is strong brown extremely channery silt loam. The substratum is strong brown extremely channery silt loam. It extends to bedrock at a depth of about 26 inches.

Typically, the surface layer of the Weikert soil is yellowish brown channery silt loam about 3 inches thick. The subsoil is brownish yellow channery silt loam about 7 inches thick. The substratum is brownish yellow extremely channery silt loam. It extends to bedrock at a depth of about 12 inches.

Included with this unit in mapping are a few areas of Caneyville and Opequon soils, a few areas where slopes are less than 15 or more than 25 percent, several areas of Rock outcrop, and several areas where the substratum is slightly acid or neutral. Included areas make up about 20 percent of this map unit.

The available water capacity of the Berks soil is very low to moderate, and that of the Weikert soil is very low. Both soils are droughty. Permeability is moderate or moderately rapid in the Berks soil and moderately rapid in the Weikert soil. Runoff is rapid on both soils. Natural fertility is low. These soils generally are strongly acid or very strongly acid. Some areas have been limed. The surface layer in these areas is moderately acid to neutral. The roots of some plants are restricted by bedrock at a depth of 20 to 40 inches in the Berks soil and 10 to 20 inches in the Weikert soil.

About one-half of the acreage of these soils is used for pasture and hay. Other areas are wooded.

This unit is not suited to cultivated crops or hay. The main management concern is low production because of the depth to bedrock, the low natural fertility, and the very low or low available water capacity. These soils have poor tilth, and erosion has removed most of the organic matter and many nutrients, causing poor germination and reduced yields. Further erosion also is a very severe hazard in unprotected areas. In places the Weikert soil is too shallow to be deeply cultivated. If hay crops are grown on this unit, they should be established using conservation tillage.

These soils cannot be easily managed for pasture. The droughtiness limits forage production during midsummer. Further erosion is a very severe hazard if the plant cover is removed by overgrazing. Water for livestock is scarce on this unit, but potential pond sites and spring development sites are sometimes available along nearby drainageways. A planned grazing system that includes rotational grazing, proper stocking rates, brush management, and seeding of bare areas help to control erosion and maintain the desirable species of plants.

The potential productivity of this unit for trees is moderate. The depth to bedrock, the low natural fertility, and the droughtiness of these soils limit tree growth. The slope and slippage limit the use of equipment. Seedling mortality also is a limitation on these droughty soils. Plant competition is slight to moderate when openings are made in the canopy. Erosion on logging roads and skid trails also is a management concern. It can be controlled by building the roads and trails on the contour. Chestnut oak, Virginia pine, red oak, black oak, and white oak are the dominant species.

The slope, the depth to bedrock, and slippage are the main limitations on sites for dwellings. Limited topsoil interferes with the establishment of lawns and with landscaping. In most areas the bedrock is soft enough to be excavated with conventional earth-moving equipment. The dwellings should be designed so that they conform to the natural slope of the land. The less sloping areas are the best sites for dwellings. Land grading and shaping can help to overcome the slope. Establishing a plant cover and controlling runoff help to prevent excessive erosion on construction sites.

The slope and slippage are the main limitations on sites for local roads and streets. Building the roads and streets on the contour helps to overcome the slope. The bedrock commonly is encountered during road construction. It generally can be ripped with earth-moving equipment. Maintaining vegetation on roadbanks is difficult on these droughty soils. Drought-tolerant species, such as tall fescue and crownvetch, should be selected for planting.

The slope, the depth to bedrock, and slippage are limitations on sites for septic tank absorption fields. The less sloping included areas are the best sites for these fields. The deeper included soils may be available as sites for septic tank absorption fields. Installing large absorption fields on the contour results in a more even distribution of effluent over a large area.

The capability subclass is VIIe.

BnF—Berks-Weikert channery silt loams, 25 to 55 percent slopes. These steep and very steep, well drained, moderately deep and shallow soils are on hillsides. The hillsides commonly are dissected by drainageways. This unit is scattered throughout the eastern three-fourths of the county. It is about 45 percent Berks soil, 35 percent Weikert soil, and 20 percent other soils. The Berks soil is usually on the north aspects, and the Weikert is usually on the south aspects. The Berks and Weikert soils occur as areas so closely intermingled that it was not practical to map them separately.

Typically, the surface layer of the Berks soil is about 5 inches thick. The upper 1 inch is dark grayish brown channery silt loam, and the lower 4 inches is yellowish brown channery silt loam. The subsoil is about 18 inches thick. The upper 11 inches is brownish yellow channery and very channery silt loam, and the lower 7 inches is strong brown extremely channery silt loam. The substratum is strong brown extremely channery silt loam. It extends to bedrock at a depth of about 37 inches.

Typically, the surface layer of the Weikert soil is about 4 inches thick. The upper 1 inch is dark grayish brown channery silt loam, and the lower 3 inches is yellowish brown channery silt loam. The subsoil is brownish yellow very channery silt loam about 6 inches thick. The substratum is brownish yellow extremely channery silt loam. It extends to bedrock at a depth of about 16 inches.

Included with this soil in mapping are a few areas of Edom soils, a few areas where slopes are less than 25 or more than 55 percent, several areas where stones are on the surface, and a few areas of Rock outcrop. Also included are a few areas where the original topsoil has been removed by erosion, a few areas of deeper soils, and a few areas of soils that have a red subsoil. Included areas make up about 20 percent of this map unit.

The available water capacity of the Berks soil is very low to moderate, and that of the Weikert soil is very low. Both soils are droughty. Permeability is moderate or moderately rapid in the Berks soil and moderately rapid in the Weikert soil. Runoff is very rapid on both soils. Natural fertility is low. Both soils are strongly acid or very strongly acid. The roots of some plants are restricted by bedrock at a depth of 20 to 40 inches in the Berks soil and 10 to 20 inches in the Weikert soil.

Most areas of this unit are used for woodland. Some areas are used for pasture.

This unit is not suited to cultivated crops or hay. The slope limits the safe use of conventional farm equipment. Erosion is a very severe hazard in unprotected areas. The depth to bedrock, the low natural fertility, and the available water capacity limit production.

This unit cannot be easily managed for pasture. The droughtiness limits forage production during midsummer. Erosion is a very severe hazard if the plant cover is removed by overgrazing. The slope limits the safe use of the conventional farm equipment used in applying fertilizer and in clipping. Water for livestock is scarce on this unit, but pond sites and potential spring development sites commonly are available along nearby drainageways. A planned grazing system that includes rotational grazing, proper stocking rates, and brush management help to control erosion and maintain the desirable species of plants.

The potential productivity of this unit for trees is moderate. The depth to bedrock, the low natural fertility, and the droughtiness restrict tree growth. The slope limits the use of equipment. Operating the equipment in the steeper areas is unsafe. Plant competition is slight to moderate when openings are made in the canopy. Seedling mortality also is a limitation on these droughty soils. Erosion on logging roads and skid trails also is a management concern. It can be controlled by building the roads and trails on the contour. Chestnut oak, Virginia pine, red oak, black oak, and white oak are the dominant species.

The slope and the depth to bedrock are the main limitations affecting most urban uses. A soil that is better suited to these uses should be considered.

The capability subclass is VIIe.

BnF3—Berks-Weikert channery silt loams, 25 to 55 percent slopes, severely eroded. These very steep and steep, well drained, moderately deep and shallow soils are on hillsides. Erosion has removed most of the original topsoil, and the subsoil is exposed in places. In some places these soils are gullied. The hillsides commonly are dissected by drainageways. This unit is mainly on the western side of North Fork Mountain. It is about 40 percent Berks soil, 40 percent Weikert soil, and 20 percent other soils. The Berks soil is usually on the north aspects, and the Weikert is usually on the south aspects. The Berks and Weikert soils occur as areas so closely intermingled that it was not practical to map them separately.

Typically, the surface layer of the Berks soil is yellowish brown channery silt loam about 2 inches thick.

The subsoil is about 14 inches thick. The upper 8 inches is brownish yellow channery and very channery silt loam, and the lower 6 inches is strong brown extremely channery silt loam. The substratum is strong brown extremely channery silt loam. It extends to bedrock at a depth of about 23 inches.

Typically, the surface layer of the Weikert soil is yellowish brown channery silt loam about 2 inches thick. The subsoil is brownish yellow very channery silt loam about 8 inches thick. The substratum is brownish yellow extremely channery silt loam. It extends to bedrock at a depth of about 11 inches.

Included with this soil in mapping are a few areas of Caneyville and Opequon soils, a few areas where slopes are less than 25 or more than 55 percent, several areas where stones are on the surface, a few areas of Rock outcrop, and a few areas of deeper soils. Also included are a few areas of soils that have a red subsoil and several areas that are slightly acid or neutral in the substratum. Included areas make up about 20 percent of this map unit.

The available water capacity of the Berks soil is very low to moderate, and that of the Weikert soil is very low. Both soils are droughty. Permeability is moderate or moderately rapid in the Berks soil and moderately rapid in the Weikert soil. Runoff is very rapid on both soils. Natural fertility is low. Both soils are strongly acid or very strongly acid. The roots of some plants are restricted by bedrock at a depth of 20 to 40 inches in the Berks soil and 10 to 20 inches in the Weikert soil.

Most areas of this unit are used for woodland. Some areas are used for pasture.

This unit is not suited to cultivated crops or hay, and it cannot be easily managed for pasture. The slope, the hazard of erosion, the depth to bedrock, the low natural fertility, and the very low to moderate available water capacity are limitations. Erosion of the original surface layer has removed most of the organic matter and many plant nutrients, making the surface layer somewhat firm and dry and causing poor seed germination.

The potential productivity of this unit for trees is moderate. The depth to bedrock, the low natural fertility, and the droughtiness restrict tree growth. The slope and slippage limit the use of equipment, and operating the equipment in the steeper areas is unsafe. Seedling mortality also is a limitation on these droughty soils. Loss of organic matter and nutrients by erosion results in poor seed germination. Plant competition is slight to moderate when openings are made in the canopy. Erosion on logging roads and skid trails also is a management concern. It can be controlled by building the roads and trails on the contour. Chestnut oak, Virginia pine, red oak, black oak, and white oak are the dominant species.

The slope, the depth to bedrock, and slippage are the main limitations affecting most urban uses. A soil that is better suited to these uses should be considered.

The capability subclass is VIIe.

BnG—Berks-Weikert channery silt loams, 55 to 80 percent slopes. These extremely steep, well drained, moderately deep and shallow soils are on hillsides. The hillsides commonly are dissected by drainageways. This unit is scattered throughout the eastern three-fourths of the county. It is delineated only on maps of land managed by the United States Department of Agriculture, Forest Service, or on adjacent private land. On most of the private land, these soils are included in unit BnF. This unit is about 45 percent Berks soil, 35 percent Weikert soil, and 20 percent other soils. The Berks soils are usually on the north aspects, and the Weikert soils are usually on the south aspects. The Berks and Weikert soils occur as areas so closely intermingled that it was not practical to map them separately.

Typically, the surface layer of the Berks soil is about 5 inches thick. The upper 1 inch is dark grayish brown channery silt loam, and the lower 4 inches is yellowish brown channery silt loam. The subsoil is about 18 inches thick. The upper 11 inches is brownish yellow channery and very channery silt loam, and the lower 7 inches is strong brown extremely channery silt loam. The substratum is strong brown extremely channery silt loam. It extends to bedrock at a depth of about 37 inches.

Typically, the surface layer of the Weikert soil is about 4 inches thick. The upper 1 inch is dark grayish brown channery silt loam, and the lower 3 inches is yellowish brown channery silt loam. The subsoil is brownish yellow very channery silt loam about 6 inches thick. The substratum is brownish yellow extremely channery silt loam. It extends to bedrock at a depth of about 13 inches.

Included with this unit in mapping are a few areas of Edom soils, a few areas where slopes are less than 55 percent, several areas where stones are on the surface, and a few areas of Rock outcrop. Also included are a few areas where the original topsoil has been removed by erosion, a few areas of deeper soils, and a few areas that have a red subsoil. Included areas make up about 20 percent of this map unit.

The available water capacity of the Berks soil is very low to moderate, and that of the Weikert soil is very low. Both soils are droughty. Permeability is moderate or moderately rapid in the Berks soil and moderately rapid in the Weikert soil. Runoff is very rapid on both soils. Natural fertility is low. Both soils are strongly acid or very strongly acid. The roots of some plants are restricted by bedrock at a depth of 20 to 40 inches in the Berks soil and 10 to 20 inches in the Weikert soil.

This unit is used almost exclusively for woodland. It is not suited to cultivated crops, hay, or pasture. The slope prevents the use of conventional farm equipment. The hazard of erosion is very severe in unprotected areas.

The potential productivity of this unit for trees is moderate. The limited depth to bedrock, the low natural fertility, and the droughtiness restrict tree growth. Because of the slope, operating conventional harvesting equipment is unsafe on this unit. Alternative methods of logging, such as cable logging, are needed. Construction of logging roads and skid trails is not recommended because of the hazard of erosion and the unsafe operating conditions. Plant competition is slight to moderate when openings are made in the canopy. Seedling mortality also is a limitation on these droughty soils. Chestnut oak, Virginia pine, red oak, black oak, and white oak are the dominant species.

The slope prohibits the use of this unit for dwellings, sanitary facilities, and local roads and streets. The depth to bedrock also is a limitation.

The capability subclass is VIIe.

BnG3—Berks-Weikert channery silt loams, 55 to 80 percent slopes, severely eroded. These extremely steep, well drained, moderately deep and shallow soils are on hillsides. Erosion has removed most of the original topsoil, and the subsoil is exposed in places. In some places these soils are gullied. The hillsides commonly are dissected by drainageways. This unit is mainly on the western side of North Fork Mountain. It is delineated only on maps of land managed by the United States Department of Agriculture, Forest Service, or adjacent private land. On most of the private land, these soils are included in unit BnF3. This unit is about 40 percent Berks soil, 40 percent Weikert soil, and 20 percent other soils. The Berks soil is usually on the north aspects, and the Weikert soil is usually on the south aspects. The Berks and Weikert soils occur as areas so closely intermingled that it was not practical to map them separately.

Typically, the surface layer of the Berks soil is yellowish brown channery silt loam about 1 inch thick. The subsoil is about 13 inches thick. The upper 8 inches is brownish yellow channery and very channery silt loam, and the lower 5 inches is strong brown extremely channery silt loam. The substratum is strong brown extremely channery silt loam. It extends to bedrock at a depth of about 22 inches.

Typically, the surface layer of the Weikert soil is yellowish brown channery silt loam about 2 inches thick. The subsoil is brownish yellow very channery silt loam about 8 inches thick. The substratum is brownish yellow extremely channery silt loam. It extends to bedrock at a depth of about 11 inches.

Included with this unit in mapping are a few areas of Caneyville and Opequon soils, a few areas where slopes are less than 55 percent, several areas where stones are on the surface, a few areas of Rock outcrop, and several areas that are slightly acid or neutral in the substratum. Also included are a few areas of deeper soils and a few areas of soils that have a red subsoil. Included areas make up about 20 percent of this map unit.

The available water capacity of the Berks soil is very low to moderate, and that of the Weikert soil is very low. Both soils are droughty. Permeability is moderate or moderately rapid in the Berks soil and moderately rapid in the Weikert soil. Runoff is very rapid on both soils. Natural fertility is low. Both soils are strongly acid or very strongly acid. The roots of some plants are restricted by bedrock at a depth of 20 to 40 inches in the Berks soil and 10 to 20 inches in the Weikert soil.

This unit is used almost exclusively for woodland. It is not suited to cultivated crops, hay, or pasture. The slope prevents the use of conventional farm equipment. The hazard of erosion is very severe.

The potential productivity of this unit for trees is moderate. The limited depth to bedrock, the low natural fertility, and the droughtiness restrict tree growth. Erosion of the original surface layer has removed most of the organic matter and many plant nutrients, making the surface layer somewhat firm and dry and causing poor seed germination. Because of the slope, operating vehicular equipment is unsafe on these soils. Alternative methods of logging, such as cable logging, are needed. Construction of logging roads and skid trails is not recommended because of the hazard of erosion, slippage, and the unsafe operating conditions. Seedling mortality also is a limitation on these droughty, severely eroded soils. Plant competition is slight to moderate when openings are made in the canopy. Chestnut oak, Virginia pine, red oak, black oak, and white oak are the dominant species.

The slope and slippage prohibit the use of this unit for dwellings, sanitary facilities, and local roads and streets. The depth to bedrock also is a limitation.

The capability subclass is VIIe.

BrC—Blackthorn channery sandy loam, 8 to 15 percent slopes. This soil is very deep, strongly sloping, and well drained. It is on foot slopes and benches and in coves. Sinkholes are common in some areas.

Typically, the surface layer is dark yellowish brown channery sandy loam about 7 inches thick. The subsoil is 65 inches or more thick. The upper 53 inches is light yellowish brown, yellowish brown, and brownish yellow very channery sandy loam and very channery loam, and the lower 12 inches is yellowish red clay.

Included with this soil in mapping are a few small areas of Dekalb and Elliber soils. Also included are a few areas of moderately well drained soils, a few areas of soils that have a stony surface layer, a few areas where slopes are less than 8 or more than 15 percent, and a few areas of soils that have a very channery surface layer. Included soils make up about 25 percent of this map unit.

The available water capacity of the Blackthorn soil is moderate. Permeability is moderate or moderately rapid in the upper part of the subsoil and moderate or moderately slow in the lower part. Runoff is rapid. Natural fertility is low in the upper part of the profile and medium in the lower part. This soil generally is moderately acid to very strongly acid in the surface layer and the upper part of the subsoil and is strongly acid or very strongly acid in the lower part of the subsoil. Some areas have been limed. The surface layer in these areas is slightly acid or neutral. The depth to bedrock is more than 60 inches.

Most areas of this soil are used for pasture. Some areas are used for cultivated crops, hay, or woodland.

This soil is suited to cultivated crops. Erosion is a severe hazard in unprotected areas. In some areas numerous rock fragments make tillage difficult. Including hay in the crop rotation, applying a system of conservation tillage, farming on the contour, growing cover crops and green manure crops, contour stripcropping, returning crop residue to the soil, and establishing grassed waterways for the safe removal of concentrated runoff help to control erosion and maintain tilth.

This soil is suited to hay and pasture. Erosion is a severe hazard if the plant cover is removed by overgrazing. Water for grazing animals is often scarce. This soil is poorly suited to construction of successful ponds, and springs are rare. A planned grazing system that includes rotational grazing, proper stocking rates, and cutting of hay at the proper stages of maturity help to control erosion and maintain the desirable species of plants.

A small acreage is wooded. The potential productivity of this soil for trees is moderately high. Few limitations affect woodland management, but plant competition is moderate when openings are made in the canopy. Erosion on logging roads and skid trails also is a management concern. It can be controlled by building the roads and trails on the contour. Red oak, white oak, white pine, and black walnut are the dominant species.

The slope is a moderate limitation on sites for dwellings. The dwellings should be designed so that they conform to the natural slope of the land. The less sloping areas are the best sites for dwellings. Establishing a plant cover and controlling runoff help to prevent excessive erosion on construction sites.

The slope is a moderate limitation on sites for local roads and streets. Building the roads and streets on the contour helps to overcome this limitation.

The slope is a moderate limitation on sites for septic tank absorption fields. The bedrock in some areas is cavernous and may allow effluent to pollute ground water. Installing the absorption fields on the contour results in a more even distribution of effluent.

The capability subclass is IIIe.

BrD—Blackthorn channery sandy loam, 15 to 25 percent slopes. This soil is very deep, moderately steep, and well drained. It is on foot slopes and benches and in coves. Sinkholes are common in some areas.

Typically, the surface layer is about 6 inches thick. The upper 3 inches is very dark grayish brown channery sandy loam, and the lower 3 inches is yellowish brown channery sandy loam. The subsoil is 66 inches or more thick. The upper 52 inches is light yellowish brown, yellowish brown, and brownish yellow very channery sandy loam and very channery loam, and the lower 14 inches is yellowish red clay.

Included with this soil in mapping are a few small areas of Dekalb and Elliber soils. Also included are a few areas of soils that have a stony surface layer, a few areas where slopes are less than 15 or more than 25 percent, and a few areas of soils that have a very channery surface layer. Included soils make up about 25 percent of this map unit.

The available water capacity of the Blackthorn soil is moderate. Permeability is moderate or moderately rapid in the upper part of the subsoil and moderate or moderately slow in the lower part. Runoff is rapid. Natural fertility is low in the upper part of the profile and medium in the lower part. This soil generally is moderately acid to very strongly acid in the surface layer and the upper part of the subsoil and is strongly acid or very strongly acid in the lower part of the subsoil. Some areas have been limed. The surface layer in these areas is slightly acid or neutral. The depth to bedrock is more than 60 inches.

Most areas of this soil are used for woodland. A few areas are used for pasture and hay.

This soil has limited suitability for cultivated crops. Erosion is a severe hazard in unprotected areas. In some areas numerous rock fragments make tillage difficult. If this soil is cultivated, including hay in the long-term crop rotations, applying a system of conservation tillage, farming on the contour, growing cover crops and green manure crops, contour stripcropping, returning crop residue to the soil, and establishing grassed waterways for the safe removal of concentrated runoff help to control erosion and maintain tilth.

This unit is suited to hay and pasture. Erosion is a severe hazard if the plant cover is removed by overgrazing. Water for grazing animals is often scarce. This soil is poorly suited to construction of successful ponds, and springs are rare. A planned grazing system that includes rotational grazing, proper stocking rates, brush management, and cutting of hay at the proper stages of maturity help to control erosion and maintain the desirable species of plants.

Most areas are wooded. The potential productivity of this soil for trees is moderately high. The slope moderately limits the operation of logging equipment. Erosion on logging roads and skid trails also is a management concern. It can be controlled by building the roads and trails on the contour. Plant competition is moderate when openings are made in the canopy. Seedling mortality is a management concern on south aspects. Red oak, white oak, white pine, and black walnut are the dominant species.

The slope is the main limitation on sites for dwellings. The dwellings should be designed so that they conform to the natural slope of the land. The less sloping areas are the best sites for dwellings. Land grading and shaping can help to overcome the slope. Establishing a plant cover and controlling runoff help to prevent excessive erosion on construction sites.

The slope is the main limitation on sites for local roads and streets. Building the roads on the contour helps to overcome this limitation.

The slope is the main limitation on sites for septic tank absorption fields. The bedrock in some areas is cavernous and may allow effluent to pollute ground water. Installing the absorption fields on the contour results in a more even distribution of effluent.

The capability subclass is IVe.

BsC—Blackthorn channery sandy loam, 3 to 15 percent slopes, stony. This soil is very deep, gently sloping to strongly sloping, and well drained. Stones cover 1 to 3 percent of the surface. Sinkholes are common in some areas. This soil is along foot slopes, in coves, and on benches.

Typically, the surface layer is about 7 inches thick. The upper 3 inches is very dark grayish brown channery sandy loam, and the lower 4 inches is yellowish brown channery sandy loam. The subsoil is 65 inches or more thick. The upper 53 inches is light yellowish brown, yellowish brown, or brownish yellow very channery sandy loam and very channery loam, and the lower 12 inches is yellowish red clay.

Included with this soil in mapping are a few areas of Dekalb and Elliber soils. Also included are small areas where slopes are more than 15 percent, areas of moderately well drained soils, areas of nonstony soils, areas where stones cover more than 3 percent of the surface, and a few areas of soils that have more clay in the upper part of the subsoil than the Blackthorn soil. Included soils make up about 25 percent of the map unit.

The available water capacity of the Blackthorn soil is moderate. Permeability is moderate or moderately rapid in the upper part of the subsoil and moderate or moderately slow in the lower part. Runoff is medium or rapid. Natural fertility is low in the upper part of the profile and medium in the lower part. This soil is moderately acid to very strongly acid in the surface layer and the upper part of the subsoil and is strongly acid or very strongly acid in the lower part of the subsoil. The depth to bedrock is more than 60 inches.

Most areas of this soil are used for pasture and woodland.

This soil is not suited to cultivated crops. The surface stoniness is the main limitation. Areas that are cleared of stones are suited to hay, but the stones beneath the surface would interfere with cultivation for crops.

This soil is suited to pasture. The stones interfere with clipping. Erosion is a moderate or severe hazard if the plant cover is removed by overgrazing. Water for grazing animals is often scarce. This soil is poorly suited to construction of successful ponds, and springs are rare. A planned grazing system that includes rotational grazing, proper stocking rates, and brush management help to control erosion and maintain the desirable species of plants.

The potential productivity of this soil for trees is moderately high. Few limitations affect woodland management, but plant competition is moderate when openings are made in the canopy. The stones and other rock fragments in the surface layer interfere with the planting of seedlings. Erosion on logging roads and skid trails also is a management concern. It can be controlled by building the roads and trails on the contour. Red oak, white oak, white pine, and black walnut are the dominant species.

Slopes of more than 8 percent are the main limitation on sites for dwellings. The stones interfere with the establishment of lawns and with landscaping. The dwellings should be designed so that they conform to the natural slope of the land. The less sloping areas are the best sites for dwellings. Stones can be removed from lawn areas. Establishing a plant cover and controlling runoff help to prevent excessive erosion on construction sites.

Slopes of more than 8 percent are the main limitation on sites for local roads and streets. Building the roads on the contour helps to overcome this limitation.

Slopes of more than 8 percent are the main limitation on sites for septic tank absorption fields. The bedrock in some areas is cavernous and may allow effluent to pollute ground water. Installing the absorption fields on the contour results in a more even distribution of effluent.

The capability subclass is VIs.

BsE—Blackthorn channery sandy loam, 15 to 35 percent slopes, stony. This soil is moderately steep to steep, well drained, and very deep. It is on benches and foot slopes of hillsides. Stones cover 1 to 3 percent of the surface.

Typically, the surface layer is about 6 inches thick. The upper 2 inches is very dark grayish brown channery sandy loam, and the lower 4 inches is yellowish brown channery sandy loam. The subsoil is 66 inches or more thick. The upper 54 inches is light yellowish brown, yellowish brown, or brownish yellow very channery sandy loam and very channery loam, and the lower 12 inches is yellowish red clay.

Included with this soil in mapping are a few small areas of Dekalb and Elliber soils. Also included are small areas where slopes are less than 15 or more than 35 percent, areas of nonstony or very stony soils, and a few areas of soils that have more clay in the upper part of the subsoil than the Blackthorn soil. Included soils make up about 30 percent of this map unit.

The available water capacity of the Blackthorn soil is moderate. Permeability is moderate or moderately rapid in the upper part of the subsoil and moderate or moderately slow in the lower part. Runoff is rapid or very rapid. Natural fertility is low in the upper part of the profile and medium in the lower part. This soil is moderately acid to very strongly acid in the surface layer and the upper part of the subsoil and is strongly acid or very strongly acid in the lower part of the subsoil. The depth to bedrock is more than 60 inches.

Most areas of this soil are used for woodland. A few areas are used for pasture.

This soil is not suited to cultivated crops. The surface stoniness and the slope are the main limitations. The less sloping areas that are cleared of stones are suited to hay, but the stones beneath the surface would interfere with cultivation of crops.

This soil cannot be easily managed for pasture. The slope is the main limitation. The surface stoniness also is a limitation. Operating the conventional equipment used in clipping and in applying fertilizer is unsafe in the steeper areas. Erosion is a severe hazard if the plant cover is removed by overgrazing. Water for grazing animals is often scarce. This soil is poorly suited to construction of successful ponds, and springs are rare. A planned grazing system that includes rotational grazing, proper stocking rates, and brush management help to control erosion and maintain the desirable species of plants.

The potential productivity of this soil for trees is moderately high. The slope limits the use of equipment. Plant competition is moderate when openings are made in the canopy. Erosion on logging roads and skid trails also is a management concern. It can be controlled by building the roads and trails on the contour. The stones and other rock fragments in the surface layer interfere with the planting of seedlings. Seedling mortality is a management concern on south aspects. Red oak, white oak, white pine, and black walnut are the dominant species.

The slope is the main limitation affecting most urban uses. A soil that is better suited to these uses should be considered.

The capability subclass is VIIs.

BsF—Blackthorn channery sandy loam, 35 to 55 percent slopes, stony. This soil is very steep, well drained, and very deep. It is on the lower slopes of hillsides. Stones cover 1 to 3 percent of the surface.

Typically, the surface layer is about 5 inches thick. The upper 1 inch is very dark grayish brown channery sandy loam, and the lower 4 inches is yellowish brown channery sandy loam. The subsoil is 67 inches or more thick. The upper 48 inches is light yellowish brown, yellowish brown, or brownish yellow very channery sandy loam and very channery loam, and the lower 19 inches is yellowish red clay.

Included with this soil in mapping are a few small areas of Dekalb and Elliber soils. Also included are areas where slopes are less than 35 percent and a few areas where stones cover more than 3 percent of the surface. Included soils make up about 20 percent of the map unit.

The available water capacity of the Blackthorn soil is moderate. Permeability is moderate or moderately rapid in the upper part of the subsoil and moderate or moderately slow in the lower part. Runoff is very rapid. Natural fertility is low in the upper part of the profile and medium in the lower part. This soil is moderately acid to very strongly acid in the surface layer and the upper part of the subsoil and is strongly acid or very strongly acid in the lower part of the subsoil. The depth to bedrock is more than 60 inches.

Most areas of this soil are used for woodland.

This soil is not suited to cultivated crops or hay. The slope prevents the safe operation of conventional farm equipment.

This soil cannot be easily managed for pasture. The slope prevents the safe operation of the conventional equipment used in clipping and in applying fertilizer. The hazard of erosion is very severe in areas where the plant cover is removed by overgrazing.

The potential productivity of this soil for trees is moderately high. The slope prevents the safe operation of logging equipment. Erosion on logging roads and skid trails also is a management concern. It can be controlled by building the roads and trails on the contour. Plant competition is moderate when openings are made in the canopy. The stones and other rock fragments in the surface layer interfere with the planting of seedlings. Seedling mortality is a management concern on south aspects. Red oak, white oak, white pine, and black walnut are the dominant species.

The slope is the main limitation affecting most urban uses. A soil that is better suited to these uses should be considered.

The capability subclass is VIIs.

BtC—Blackthorn-Dekalb-Elliber association, 3 to 15 percent slopes, stony. These very deep and moderately deep, well drained, gently sloping and strongly sloping soils are on ridgetops, benches, and foot slopes. The Blackthorn soils are typically on the lower slopes, on foot slopes and benches, and in coves. The Dekalb and Elliber soils are typically on ridgetops and the upper slopes. The Elliber soil also is on benches. Stones cover 1 to 3 percent of the surface. This unit is in a wide band that is oriented in a north-south direction across the central part of the county. It is in forested mountainous areas. This unit is about 45 percent Blackthorn soil, 20 percent Dekalb soil, 15 percent Elliber soil, and 20 percent other soils.

Typically, the surface layer of the Blackthorn soil is about 7 inches thick. The upper 3 inches is very dark grayish brown channery sandy loam, and the lower 4 inches is yellowish brown channery sandy loam. The subsoil is 65 inches or more thick. The upper 53 inches is light yellowish brown, yellowish brown, or brownish yellow very channery sandy loam and very channery loam, and the lower 12 inches is yellowish red clay.

Typically, the surface layer of the Dekalb soil is about 6 inches thick. The upper 3 inches is very dark gray very channery sandy loam, and the lower 3 inches is grayish brown very channery sandy loam. The subsoil is yellowish brown channery sandy loam and very channery sandy loam. It extends to sandstone at a depth of about 26 inches.

Typically, the surface layer of the Elliber soil is about 10 inches thick. The upper 4 inches is very dark gray extremely channery loam, and the lower 6 inches is light brownish gray extremely channery sandy loam. The subsoil is 55 inches or more thick. The upper 7 inches is brownish yellow extremely channery loam, and the lower 48 inches is light yellowish brown extremely channery loam.

Included with these soils in mapping are a few small areas of Buchanan, Hazleton, and Laidig soils, a few areas of nonstony soils, a few areas where slopes are more than 15 percent, and a few small areas of Rock outcrop. In some places are areas of soils that are similar to the Dekalb soil but are slightly acid or neutral in the lower part of the subsoil. Also included are several areas where stones cover more than 3 percent of the surface and a few areas of soils that have more sand than the Blackthorn, Dekalb, and Elliber soils. Included soils generally make up about 20 percent of the map unit, but the percentage of inclusions is higher in the very stony areas.

The available water capacity of the Blackthorn soil is moderate, that of the Dekalb soil is very low to moderate, and that of the Elliber soil is low or moderate. Permeability is moderate or moderately rapid in the upper part of the subsoil in the Blackthorn soil and moderate or moderately slow in the lower part. It is moderately rapid or rapid in the Dekalb and Elliber soils. Runoff is rapid or medium on all three soils. Natural fertility is low in the upper part of the Blackthorn soil and medium in the lower part. It is medium in the Elliber soil and low in the Dekalb soil. The Blackthorn soil is moderately acid to very strongly acid in the surface layer and the upper part of the subsoil and is strongly acid or very strongly acid in the lower part. The Dekalb and Elliber soils are extremely acid to strongly acid throughout. The depth to bedrock is more than 60 inches in the Blackthorn and Elliber soils. The roots of some plants are restricted by bedrock at a depth of 20 to 40 inches in the Dekalb soil.

This unit is used almost entirely for woodland. A few small areas are used for pasture.

This unit is not suited to cultivated crops. The surface stoniness is the main limitation. Areas that are cleared of stones are suited to hay, but the stones beneath the surface would interfere with cultivation of crops.

This unit is suited to pasture, but the droughtiness of the Dekalb soil limits forage production during midsummer. The stones interfere with clipping. Erosion is a moderate or severe hazard if the plant cover is removed by overgrazing. Water for grazing animals is often scarce. This unit is poorly suited to construction of successful ponds, and springs are rare. A planned grazing system that includes rotational grazing, proper stocking rates, and brush management help to control erosion and maintain the desirable species of plants.

The potential productivity of this unit for trees is moderate or moderately high. Few limitations affect woodland management, but plant competition is a limitation when openings are made in the canopy. Also, seedling mortality is a moderate limitation on the Dekalb soil. The stones and other rock fragments in the surface layer interfere with the planting of seedlings. Erosion on logging roads and skid trails also is a management concern. It can be controlled by building the roads and trails on the contour. Red oak, white oak, white pine, and black locust are the dominant species on the Blackthorn and Elliber soils. Chestnut oak and Virginia pine are dominant on the droughty Dekalb soil. Red oak, black oak, and white oak are less common on the Dekalb soil.

Slopes of more than 8 percent are a moderate limitation on sites for dwellings. The limited depth to bedrock also is a limitation on the Dekalb soil, especially on sites for dwellings with basements. The stones interfere with the establishment of lawns and with landscaping. The dwellings should be designed so that they conform to the natural slope of the land. The less sloping areas are the best sites for dwellings. Stones can be removed from lawn areas. The deeper soils are available for building site development. If areas of the Dekalb soil are used for dwellings with basements, building above the bedrock and landscaping with additional fill material may be preferable to excavating the hard bedrock. Establishing a plant cover and controlling runoff help to prevent excessive erosion on construction sites.

Slopes of more than 8 percent and the depth to bedrock in areas of the Dekalb soil are limitations on sites for local roads and streets. Building the roads on the contour helps to overcome the slope. The deeper soils are the best sites for local roads and streets. Some blasting may be required if roads are constructed on the Dekalb soil. The Elliber soil is locally considered as a good source of cherty base material for roads.

The depth to bedrock in areas of the Dekalb soil and slopes of more than 8 percent are limitations on sites for septic tank absorption fields. The limestone underlying the Blackthorn soil in some areas is cavernous and may allow effluent to pollute ground water. The less sloping areas are the best sites for septic tank absorption fields. Installing the absorption fields on the contour results in a more even distribution of effluent. The deeper soils are available for use as sites for septic tank absorption fields.

The capability subclass is VIs.

BtE—Blackthorn-Dekalb-Elliber association, 15 to 35 percent slopes, stony. These very deep and moderately deep, well drained, steep and moderately steep soils are on ridgetops, benches, and hillsides. The Blackthorn soil typically is on benches and the lower slopes of hillsides. The Dekalb and Elliber soils typically are on ridgetops and the upper slopes of hillsides. The Elliber soil also is on benches. Stones cover 1 to 3 percent of the surface. Outcrops of rock are common on the Dekalb soil. This unit is in a wide band that is oriented in a north-south direction across the central part of the county. It is in forested mountainous areas. This unit is about 30 percent Blackthorn soil, 30 percent Dekalb soil, 20 percent Elliber soil, and 20 percent other soils and Rock outcrop.

Typically, the surface layer of the Blackthorn soil is about 6 inches thick. The upper 2 inches is very dark grayish brown channery sandy loam, and the lower 4 inches is yellowish brown channery sandy loam. The subsoil is 66 inches or more thick. The upper 54 inches is light yellowish brown, yellowish brown, or brownish yellow very channery sandy loam and very channery loam, and the lower 12 inches is yellowish red clay.

Typically, the surface layer of the Dekalb soil is about 3 inches thick. The upper 1 inch is very dark gray very channery sandy loam, and the lower 2 inches is grayish brown very channery sandy loam. The subsoil is yellowish brown channery sandy loam and very channery sandy loam. It extends to sandstone at a depth of about 27 inches.

Typically, the surface layer of the Elliber soil is about 9 inches thick. The upper 4 inches is very dark gray extremely channery loam, and the lower 5 inches is light brownish gray extremely channery sandy loam. The subsoil is 56 inches or more thick. The upper 6 inches is brownish yellow extremely channery loam, and the lower 50 inches is light yellowish brown extremely channery loam.

Included with this unit in mapping are a few small areas of Buchanan, Edom, Hazleton, Laidig, and Opequon soils. Also included are a few small areas where slopes are more than 35 percent, a few small areas of Rock outcrop, a few small areas of soils that have more sand in the subsoil than the Blackthorn, Dekalb, and Elliber soils, and several areas where stones cover more than 3 percent of the surface. In some places are soils that are similar to the Dekalb soil but are slightly acid or neutral in the lower part of the subsoil. Included areas generally make up about 20 percent of this unit, but the percentage of inclusions is higher in very stony areas.

The available water capacity of the Blackthorn soil is moderate, that of the Dekalb soil is very low to moderate, and that of the Elliber is low or moderate. Permeability is moderate or moderately rapid in the upper part of the subsoil in the Blackthorn soil and moderate or moderately slow in the lower part. It is moderately rapid or rapid in the Dekalb and Elliber soils. Runoff is rapid or very rapid on all three soils. Natural fertility is low in the upper part of the Blackthorn soil and medium in the lower part. It is medium in the Elliber soil and low in the Dekalb soil. The Blackthorn soil is moderately acid to very strongly acid in the surface layer and the upper part of the subsoil and is strongly acid or very strongly acid in the lower part. The Dekalb and Elliber soils are extremely acid to strongly acid. The depth to bedrock is more than 60 inches in the Blackthorn and Elliber soils. The roots of some plants are restricted by bedrock at a depth of 20 to 40 inches in the Dekalb soil.

This unit is used almost entirely for woodland. A few small areas are used for pasture.

This unit is not suited to cultivated crops. The surface stoniness and the slope are the main limitations. The less sloping areas that are cleared of stones are suited to hay, but the stones beneath the surface would interfere with cultivation of crops.

This unit cannot be easily managed for pasture. The slope is the main limitation. The surface stoniness also is a limitation. Operating the conventional equipment used in clipping and in applying fertilizer is unsafe in the steeper areas. Erosion is a severe hazard if the plant cover is removed by overgrazing. Water for grazing animals is often scarce. This unit is poorly suited to construction of successful ponds, and springs are rare. A planned grazing system that includes rotational grazing, proper stocking rates, and brush management help to control erosion and maintain the desirable species of plants.

The potential productivity of this unit for trees is moderate to moderately high. The slope limits the use of equipment. Plant competition is a limitation when openings are made in the canopy. Erosion on logging roads and skid trails also is a management concern. It can be controlled by building the roads and trails on the contour. The stones and other rock fragments in the surface layer interfere with the planting of seedlings. Seedling mortality is a slight to moderate limitation. Red oak, white oak, white pine, and black locust are the dominant species on the Blackthorn and Elliber soils. Chestnut oak and Virginia pine are dominant on the droughty Dekalb soil. Red oak, black oak, and white oak also are on the Dekalb soil.

The slope is a main limitation affecting most urban uses. A soil that is better suited to these uses should be considered. Locally the Elliber soil is considered as a good source of cherty base material for roads.

The capability subclass is VIIs.

BuB—Buchanan channery loam, 3 to 8 percent slopes. This soil is very deep, gently sloping, and moderately well drained. It is on foot slopes, in coves, along drainageways, and on benches. Seep spots are common during the wet months in winter and spring.

Typically, the surface layer is dark yellowish brown channery loam about 7 inches thick. The subsoil is about 43 inches thick. The upper 8 inches is light yellowish brown loam and sandy clay loam. The next 7 inches is yellowish brown channery sandy clay loam mottled with light brownish gray. The lower 28 inches is light yellowish brown, very firm and brittle channery loam and very channery loam mottled with light gray, yellowish brown, strong brown, brownish yellow, and dark red. The part of the substratum between depths of 50 and 57 inches is pale brown channery loam mottled with yellowish brown, light gray, dark yellowish brown, and red. The part between depths of 57 and 65 inches or more is light brownish gray channery loam mottled with yellowish brown and red.

Included with this soil in mapping are a few areas of Laidig soils. Also included are a few areas of soils that do not have a very firm and brittle subsoil, a few areas of stony soils, a few areas where slopes are less than 3 or more than 8 percent, and a few areas of poorly drained soils. Included soils make up about 20 percent of this unit.

The available water capacity of the Buchanan soil is moderate. This soil has a fragipan. Permeability is moderate above the fragipan and slow in it. Runoff is medium. Natural fertility is low or medium. This soil generally is extremely acid to strongly acid. Some areas have been limed. The surface layer in these areas is slightly acid or neutral. This soil has a seasonal high water table that rises to about 1.5 feet from the surface during wet periods. The seasonal high water table and the fragipan may restrict the rooting depth of some plants. The depth to bedrock is more than 60 inches.

Most areas of this soil are used for pasture and hay. A few areas are used for cultivated crops or woodland.

This soil is suited to cultivated crops. Erosion is a moderate hazard in unprotected areas. The wetness often delays spring planting. Because of the restricted rooting depth, some plants are adversely affected by a shortage of water as the soil dries out in summer. Including hay in the crop rotation, applying a system of conservation tillage, farming on the contour, growing cover crops and green manure crops, and returning crop residue to the soil help to control erosion and maintain tilth.

This soil is suited to hay and pasture. It is better suited to grasses than legumes because of the seasonal high water table. This soil is soft when wet, and grazing early in spring can damage the sod. Erosion is a moderate hazard if the plant cover is removed by overgrazing. A planned grazing system that includes rotational grazing, proper stocking rates, deferment of spring grazing until the soil is firm, and cutting of hay at the proper stages of maturity help to control erosion and maintain the desirable species of plants.

The potential productivity of this soil for trees is moderate. Plant competition is moderate when openings are made in the canopy. Erosion on logging roads and skid trails also is a management concern. It can be controlled by building the roads and trails on the contour. Because this soil is soft when wet, the use of equipment may be restricted during wet periods. Red oak, white oak, black oak, and eastern white pine are the dominant species.

The seasonal high water table is the main limitation on sites for dwellings, especially for dwellings with basements. Installing footer drains and waterproofing walls help to keep basements dry. The well drained included soils are the best sites for dwellings with basements. Establishing a plant cover and controlling runoff help to prevent excessive erosion on construction sites.

The seasonal high water table and potential frost action are limitations on sites for local roads and streets. Because this soil is soft when wet, the pavement can crack under heavy loads. Constructing the roads and streets on raised fill material and installing a drainage system help to overcome the limitations.

The seasonal high water table and slow permeability are limitations on sites for septic tank absorption fields. In a few areas the better drained, more rapidly permeable included soils are available for use as sites for septic tank absorption fields. Installing deep drainage tile upslope from the absorption field can be effective in lowering the seasonal high water table. Installing large absorption fields on the contour helps to overcome the slow permeability.

The capability subclass is IIe.

BuC—Buchanan channery loam, 8 to 15 percent slopes. This soil is very deep, strongly sloping, and moderately well drained. It is on foot slopes, in coves, along drainageways, and on benches. Seep spots are common during wet months in winter and spring.

Typically, the surface layer is about 7 inches thick. The upper 3 inches is very dark grayish brown channery loam, and the lower 4 inches is light yellowish brown channery loam. The subsoil is about 43 inches thick. The upper 8 inches is light yellowish brown loam and sandy clay loam. The next 7 inches is yellowish brown channery sandy clay loam mottled with light brownish gray. The lower 28 inches is light yellowish brown, very firm and brittle channery loam and very channery loam mottled with light gray, yellowish brown, strong brown, brownish yellow, and dark red. The part of the substratum between depths of 50 and 57 inches is pale brown channery loam mottled with yellowish brown, light gray, dark yellowish brown, and red. The part between depths of 57 and 65 inches or more is light brownish gray channery loam mottled with yellowish brown and red.

Included with this soil in mapping are a few areas of Laidig soils. Also included are a few areas of soils that do not have a very firm and brittle subsoil, a few areas of stony soils, a few areas where slopes are less than 8 or more than 15 percent, and a few areas of poorly drained soils. Included soils make up about 20 percent of this map unit.

The available water capacity of the Buchanan soil is moderate. This soil has a fragipan. Permeability is moderate above the fragipan and slow in it. Runoff is rapid. Natural fertility is low or medium. This soil generally is extremely acid to strongly acid. Some areas have been limed. The surface layer in these areas is slightly acid or neutral. This soil has a seasonal high water table that rises to about 1.5 feet from the surface during wet periods. The seasonal high water table and the fragipan may restrict the rooting depth of some plants. The depth to bedrock is more than 60 inches.

Most areas of this soil are used for woodland. A few areas are used for cultivated crops or for hay and pasture.

This soil is suited to cultivated crops. Erosion is a severe hazard in unprotected areas. Wetness often delays spring planting. Because of the restricted rooting depth, some plants are adversely affected by a shortage of water as the soil dries out in summer. Including hay in the crop rotation, applying a system of conservation tillage, farming on the contour, growing cover crops and green manure crops, contour stripcropping, returning crop residue to the soil, and establishing grassed waterways for the safe removal of concentrated runoff help to control erosion and maintain tilth.

This soil is suited to hay and pasture. It is better suited to grasses than legumes because of the seasonal high water table. This soil is soft when wet, and grazing early in spring can damage the sod. Erosion is a severe hazard if the plant cover is removed by overgrazing. A planned grazing system that includes rotational grazing, proper stocking rates, deferment of spring grazing until the soil is firm, and cutting of hay at the proper stages of maturity help to control erosion and maintain the desirable species of plants.

Most acreage is wooded. The potential productivity of this soil for trees is moderate. Plant competition is moderate when openings are made in the canopy. Erosion on logging roads and skid trails also is a management concern. It can be controlled by building the roads and trails on the contour. Because this soil is soft when wet, the use of equipment may be restricted during wet periods. Red oak, white oak, black oak, and eastern white pine are the dominant species.

The seasonal high water table is the main limitation on sites for dwellings, especially for dwellings with basements. The slope also is a limitation. Installing footer drains and waterproofing walls help to keep basements dry. The well drained included soils are the best sites for dwellings with basements. The dwellings should be designed so that they conform to the natural slope of the land. The less sloping areas are the best sites for dwellings. Establishing a plant cover and controlling runoff help to prevent excessive erosion on construction sites.

The seasonal high water table, potential frost action, and the slope are limitations on sites for local roads and streets. Because this soil is soft when wet, the pavement can crack under heavy loads. Constructing the roads on raised fill material and installing a drainage system help to overcome the limitations. Building the roads and streets on the contour helps to overcome the slope.

The seasonal high water table and slow permeability are limitations on sites for septic tank absorption fields. In a few areas the better drained, more rapidly permeable included soils are available for use as sites for septic tank absorption fields. Installing deep drainage tile upslope from the absorption field can be effective in lowering the seasonal high water table. Installing large absorption fields on the contour helps overcome the slow permeability.

The capability subclass is IIIe.

CaC—Calvin channery silt loam, 3 to 15 percent slopes. This soil is moderately deep, strongly sloping to gently sloping, and well drained. It is mostly on smooth ridgetops on Shenandoah Mountain.

Typically, the surface layer is reddish brown channery silt loam about 6 inches thick. The subsoil is reddish brown channery and very channery silt loam about 13 inches thick. The substratum is reddish brown extremely channery silt loam. It extends to bedrock at a depth of about 25 inches.

Included with this soil in mapping are a few areas of Berks, Dekalb, and Lehew soils, a few areas of shallow soils, and a few areas where slopes are more than 15 percent. Also included are areas where the original topsoil has been removed by erosion. Included soils make up about 20 percent of this map unit.

The Calvin soil has a very low to moderate available water capacity. It is droughty. Permeability is moderately rapid. Runoff is medium or rapid. Natural fertility is low. This soil generally is strongly acid or very strongly acid. Some areas have been limed. The surface layer in these areas is slightly acid or neutral. The roots of some plants are restricted by bedrock at a depth of 20 to 40 inches.

Most areas of this soil are used for pasture and hay. Other areas are wooded.

This soil is suited to cultivated crops, but it is droughty. It is better suited to early maturing small grain than to late maturing crops, such as corn. Erosion is a severe or moderate hazard in unprotected areas. Including hay in the crop rotation, applying a system of conservation tillage, farming on the contour, growing cover crops and green manure crops, returning crop residue to the soil, and establishing grassed waterways for the safe removal of concentrated runoff help to control erosion and maintain tilth. A system of conservation tillage that leaves plant residue on the surface conserves moisture in this droughty soil.

This soil is suited to hay and pasture, but the droughtiness limits forage production during midsummer. Erosion is a severe or moderate hazard if the plant cover is removed by overgrazing. Water for livestock is scarce on this soil, but pond sites and potential spring development sites commonly are available along nearby drainageways. A planned grazing system that includes rotational grazing, proper stocking rates, brush management, and cutting of hay at the proper stages of maturity help to control erosion and maintain the desirable species of plants.

The potential productivity of this soil for trees is moderate. The limited depth to bedrock, the low natural fertility, and the droughtiness restrict tree growth. Seedling mortality is a management concern. Plant competition is a limitation when openings are made in the canopy. Erosion on logging roads and skid trails also is a management concern. It can be controlled by building the roads and trails on the contour. Chestnut oak, Virginia pine, red oak, black oak, and white oak are the dominant species.

The slope is a limitation on sites for dwellings on the steeper parts of this unit. Also, the bedrock interferes with excavation for basements. In most areas it is soft enough to be excavated with conventional earth-moving equipment. The dwellings should be designed so that they conform to the natural slope of the land. The less sloping areas are the best sites for dwellings. Establishing a plant cover and controlling runoff help to prevent excessive erosion on construction sites.

The slope is a limitation on sites for local roads and streets on the steeper parts of this unit. The bedrock commonly is encountered during road construction. It generally can be ripped with earth-moving equipment. Building the roads on the contour helps to overcome the slope. Maintaining vegetation on roadbanks is difficult on this droughty soil. Drought-tolerant species, such as tall fescue or crownvetch, should be selected for planting.

The depth to bedrock is the main limitation on sites for septic tank absorption fields. The slope also is a limitation. In a few areas the deeper included soils are available for use as sites for septic tank absorption fields. The less sloping areas are the best sites for these fields. Installing large absorption fields on the contour results in a more even distribution of effluent over a large area.

The capability subclass is IIIe.

CaD—Calvin channery silt loam, 15 to 25 percent slopes. This soil is moderately deep, moderately steep, and well drained. It is on ridgetops, benches, and hillsides, mostly on Shenandoah Mountain. The benches and hillsides commonly are dissected by drainageways.

Typically, the surface layer is reddish brown channery silt loam about 5 inches thick. The subsoil is reddish brown channery and very channery silt loam about 13 inches thick. The substratum is reddish brown extremely channery silt loam. It extends to bedrock at a depth of about 24 inches.

Included with this soil in mapping are several areas of Berks, Dekalb, and Lehew soils. Also included are several areas of shallow soils, several areas where the original topsoil has been removed by erosion, and a few areas where slopes are less than 15 or more than 25 percent. Included soils make up about 25 percent of this map unit.

The Calvin soil has a very low to moderate available water capacity. It is droughty. Permeability is moderately rapid. Runoff is rapid. Natural fertility is low. This soil generally is strongly acid or very strongly acid. Some areas have been limed. The surface layer in these areas is slightly acid or neutral. The roots of some plants are restricted by bedrock at a depth of 20 to 40 inches.

Most areas of this soil are used for pasture and hay. Other areas are wooded.

This soil has limited suitability for cultivated crops. It is droughty. If cultivated crops are grown, this soil is better suited to early maturing small grain than to later maturing crops, such as corn. Erosion is a severe hazard in unprotected areas. Including hay in the long-term crop rotations, applying a system of conservation tillage, farming on the contour, growing cover crops and green manure crops, contour stripcropping, returning crop residue to the soil, and establishing grassed waterways for the safe removal of concentrated runoff help to control erosion and maintain tilth. A system of conservation tillage that leaves plant residue on the surface conserves moisture in this droughty soil.

This soil is suited to hay and pasture, but the droughtiness limits forage production during midsummer. Erosion is a severe hazard if the plant cover is removed by overgrazing. Water for livestock is scarce on this soil, but pond sites and potential spring development sites commonly are available along nearby drainageways. A planned grazing system that includes rotational grazing, proper stocking rates, brush management, and cutting of hay at the proper stages of maturity help to control erosion and maintain the desirable species of plants.

The potential productivity of this soil for trees is moderate. The limited depth to bedrock, the low natural fertility, and the droughtiness restrict tree growth. The slope moderately limits the use of equipment. Seedling mortality also is a limitation on this droughty soil. Plant competition is a limitation when openings are made in the canopy. Erosion on logging roads and skid trails also is a management concern. It can be controlled by building the roads and trails on the contour. Chestnut oak, Virginia pine, red oak, black oak, and white oak are the dominant species.

The slope is the main limitation on sites for dwellings. Also, the bedrock interferes with excavation for basements. In most areas it is soft enough to be excavated with conventional earth-moving equipment. The dwellings should be designed so that they conform to the natural slope of the land. The less sloping areas are the best sites for dwellings. Land grading and shaping can help to overcome the slope. Establishing a plant cover and controlling runoff help to prevent excessive erosion on construction sites.

The slope is a limitation on sites for local roads and streets. The bedrock commonly is encountered during road construction. It generally can be ripped with earth-moving equipment. Building the roads on the contour helps to overcome the slope. Maintaining vegetation on roadbanks is difficult on this droughty soil. Drought-tolerant species, such as tall fescue and crownvetch, should be selected for planting.

The depth to bedrock and the slope are limitations on sites for septic tank absorption fields. In a few areas the deeper included soils are available for use as sites for septic tank absorption fields. The less sloping areas are the best sites for these fields. Installing large absorption fields on the contour results in a more even distribution of effluent over a large area.

The capability subclass is IVe.

CdC—Calvin-Dekalb-Hazleton complex, 3 to 15 percent slopes, stony. These gently sloping to strongly sloping, well drained, moderately deep to very deep soils are on ridgetops and benches. These soils are along the upper slopes of Shenandoah Mountain, along the eastern slopes of Timber Ridge, and within the watersheds of Big Run and Seneca Creek. Stones cover 1 to 3 percent of the surface. Slopes are generally smooth. Outcrops of sandstone are common. This unit is about 35 percent Calvin soil, 25 percent Dekalb soil, 20 percent Hazleton soil, and 20 percent other soils and Rock outcrop. The Calvin, Dekalb, and Hazleton soils occur as areas so closely intermingled on the landscape that it was not practical to map them separately.

Typically, the surface layer of the Calvin soil is dark reddish brown channery silt loam about 3 inches thick. The subsoil is reddish brown channery and very channery silt loam about 17 inches thick. The substratum is reddish brown extremely channery silt loam. It extends to bedrock at a depth of about 23 inches.

Typically, the surface layer of the Dekalb soil is about 6 inches thick. The upper 3 inches is very dark gray very channery sandy loam, and the lower 3 inches is grayish brown very channery sandy loam. The subsoil is yellowish brown channery sandy loam and very channery sandy loam. It extends to sandstone at a depth of about 26 inches.

Typically, the surface layer of the Hazleton soil is about 6 inches thick. The upper 2 inches is dark grayish brown channery sandy loam, and the lower 4 inches is yellowish brown channery sandy loam. The subsoil is yellowish brown very channery sandy loam about 31 inches thick. The part of the substratum between depths of 37 and 65 inches is yellowish brown extremely channery loamy sand.

Included with these soils in mapping are small areas of Berks and Lehew soils, some areas where stones cover more than 3 percent of the surface, and a few areas that are nonstony. Also included are small areas where slopes are more than 15 percent and small areas of Rock outcrop. Included areas make up about 20 percent of this map unit.

The available water capacity of the Calvin and Dekalb soils is very low to moderate, and that of the Hazleton soil is low or moderate. Permeability in the Dekalb and Hazleton soils is moderately rapid or rapid, and that in the Calvin soil is moderately rapid. Runoff is medium or rapid on all three soils. Natural fertility is low. The Calvin soil generally is strongly acid or very strongly acid. The Dekalb and Hazleton soils generally are strongly acid to extremely acid. Some areas have been limed. The surface layer in these areas is moderately acid to neutral. The roots of some plants may be restricted by bedrock at a depth of 20 to 40 inches in the Calvin and Dekalb soils. The depth to bedrock in areas of the Hazleton soil is at least 40 inches.

Most areas of this unit are used for woodland. A few small areas are used for pasture.

This unit is not suited to cultivated crops. The surface stoniness is the main limitation. Areas that are cleared of stones are suited to hay, but the stones beneath the surface would interfere with cultivation of crops.

This unit is suited to pasture, but the droughtiness of the Calvin and Dekalb soils limits forage production during midsummer. The stones interfere with clipping. Erosion is a moderate or severe hazard if the plant cover is removed by overgrazing. Water for livestock is scarce on this unit, but pond sites and potential spring development sites commonly are available along nearby drainageways. A planned grazing system that includes rotational grazing, proper stocking rates, and brush management help to control erosion and maintain the desirable species of plants.

Most areas are wooded. The potential productivity of this unit for trees is moderate to moderately high. The limited depth to bedrock, the low natural fertility, and the droughtiness of the Dekalb and Calvin soils restrict tree growth. Plant competition is a limitation when openings are made in the canopy. Seedling mortality also is a limitation on this droughty unit. The stones and other rock fragments in the surface interfere with the planting of seedlings. Erosion on logging roads and skid trails also is a management concern. It can be controlled by building the roads and trails on the contour. Chestnut oak, Virginia pine, red oak, black oak, and white oak are the dominant species on this unit. American beech, yellow birch, and black cherry also are common in the Big Run and upper Seneca Creek areas.

The depth to bedrock in areas of the Calvin and Dekalb soils is a limitation on sites for dwellings, especially for dwellings with basements. Slopes of more than 8 percent also are a limitation. The stones interfere with the establishment of lawns and with landscaping. The deeper soils are available for building site development. If the Calvin soil is used as a site for dwellings with basements, the bedrock that is often encountered generally can be ripped with excavation equipment. If the Dekalb soil is used for dwellings with basements, building above the bedrock and landscaping with additional fill material may be preferable to excavating the hard sandstone. The dwellings should be designed so that they conform to the natural slope of the land. The less sloping areas are the best sites for dwellings. Stones can be removed from lawn areas. Establishing a plant cover and controlling runoff help to prevent excessive erosion on construction sites.

The depth to bedrock and slopes of more than 8 percent are moderate limitations on sites for local roads and streets. Building the roads on the contour helps to overcome the slope. The less sloping areas are the best sites. The deeper soils are available for use as sites for roads and streets. The bedrock in areas of the Calvin soil generally can be ripped, but some blasting may be required if roads are constructed on the Dekalb soils.

The depth to bedrock in areas of the Calvin and Dekalb soils is a limitation on sites for septic tank absorption fields. Also, areas of the Dekalb and Hazleton soils may have such rapid permeability that the effluent from septic tanks is not adequately filtered by the soil. Slopes of more than 8 percent also are a limitation. The deeper soils are available for use as sites for septic tank absorption fields. The less sloping areas are the best sites for these fields. Installing the absorption fields on the contour results in a more even distribution of effluent.

The capability subclass is VIs.

CdE—Calvin-Dekalb-Hazleton complex, 15 to 35 percent slopes, stony. These moderately steep to steep, well drained, moderately deep to very deep soils are on ridgetops, benches, and hillsides. These soils are along the upper slopes of Shenandoah Mountain, along the eastern slopes of Timber Ridge, and within the watersheds of Big Run and Seneca Creek. Stones cover 1 to 3 percent of the surface. Slopes commonly are dissected by draingeways. Outcrops of sandstone are common. This unit is about 35 percent Calvin soil, 25 percent Dekalb soil, 20 percent Hazleton soil, and 20 percent other soils and Rock outcrop. The Calvin, Dekalb, and Hazleton soils occur as areas so closely intermingled on the landscape that it was not practical to map them separately.

Typically, the surface layer of the Calvin soil is dark reddish brown channery silt loam about 3 inches thick. The subsoil is reddish brown channery and very channery silt loam about 17 inches thick. The substratum is reddish brown extremely channery silt loam. It extends to bedrock at a depth of about 24 inches.

Typically, the surface layer of the Dekalb soil is about 5 inches thick. The upper 2 inches is very dark gray very channery sandy loam, and the lower 3 inches is grayish brown very channery sandy loam. The subsoil is yellowish brown channery sandy loam and very channery sandy loam. It extends to sandstone at a depth of about 27 inches.

Typically, the surface layer of the Hazleton soil is about 5 inches thick. The upper 1 inch is dark grayish brown channery sandy loam, and the lower 4 inches is yellowish brown channery sandy loam. The subsoil is yellowish brown very channery sandy loam about 30 inches thick. The part of the substratum between depths of 35 and 65 inches is yellowish brown extremely channery loamy sand.

Included with these soils in mapping are small areas of Berks, Lehew, and Shouns soils. Also included are some areas where stones cover more than 3 percent of the surface, a few areas that are nonstony, small areas where slopes are less than 15 or more than 35 percent, and areas of Rock outcrop. Included areas make up about 20 percent of this map unit.

The available water capacity of the Calvin and Dekalb soils is very low to moderate, and that of the Hazleton soil is low or moderate. Permeability in Dekalb and Hazleton soils is moderately rapid or rapid, and that in the Calvin soil is moderately rapid. Runoff is rapid or very rapid on all three soils. Natural fertility is low. The Calvin soil is strongly acid or very strongly acid. The Dekalb and Hazleton soils are strongly acid to extremely acid. The roots of some plants may be restricted by bedrock at a depth of 20 to 40 inches in the Calvin and Dekalb soils. The depth to bedrock in areas of the Hazleton soil is at least 40 inches.

Most areas of this unit are used for woodland. A few areas are used for pasture.

This unit is not suited to cultivated crops. Slopes are too steep for the safe operation of conventional farm equipment. The surface stoniness also is a limitation. The less sloping areas that are cleared of stones are suited to hay, but the stones beneath the surface would interfere with cultivation of crops.

This unit cannot be easily managed for pasture. The slope is the main limitation. The surface stoniness also is a limitation. Operating the conventional equipment used in clipping and in applying fertilizer is unsafe in the steeper areas. The droughtiness of the Calvin and Dekalb soils limits forage production during midsummer. Erosion is a severe hazard if the plant cover is removed by overgrazing. Water for livestock is scarce on this unit, but pond sites and potential spring development sites commonly are available along nearby drainageways. A planned grazing system that includes rotational grazing, proper stocking rates, and brush management help to control erosion and maintain the desirable species of plants.

Most areas are wooded. The potential productivity of this unit for trees is moderate to moderately high. The limited depth to bedrock, the low natural fertility, and the droughtiness of the Calvin and Dekalb soils restrict tree growth. The slope limits the use of equipment. Plant competition is a limitation when openings are made in the canopy. Because of the droughtiness of the Calvin and Dekalb soils, seedling mortality also is a limitation. The stones and other rock fragments in the surface layer interfere with the planting of seedlings. Erosion on logging roads and skid trails also is a management concern. It can be controlled by building the roads and trails on the contour. Chestnut oak, Virginia pine, red oak, black oak, and white oak are the dominant species on this unit. American beech, yellow birch, and black cherry also are common in the Big Run and upper Seneca Creek area.

The slope is a main limitation of all three soils for most urban uses, and the depth to bedrock in areas of the Calvin and Dekalb soils also is a limitation. A soil that is better suited to these uses should be considered.

The capability subclass is VIIs.

CdF—Calvin-Dekalb-Hazleton complex, 35 to 55 percent slopes, stony. These very steep, well drained, moderately deep to very deep soils are on hillsides. These soils are along the upper slopes of Shenandoah Mountain, along the eastern slopes of Timber Ridge, and within the watersheds of Big Run and Seneca Creek. Stones cover 1 to 3 percent of the surface. Slopes commonly are dissected by drainageways. Outcrops of sandstone are common. This unit is about 45 percent Calvin soil, 20 percent Dekalb soil, 15 percent Hazleton soil, and 20 percent other soils and Rock outcrop. The Calvin, Dekalb, and Hazleton soils occur as areas so closely intermingled on the landscape that it was not practical to map them separately.

Typically, the surface layer of the Calvin soil is dark reddish brown channery silt loam about 2 inches thick. The subsoil is reddish brown channery and very channery silt loam about 16 inches thick. The substratum is reddish brown extremely channery silt loam. It extends to bedrock at a depth of about 24 inches.

Typically, the surface layer of the Dekalb soil is about 3 inches thick. The upper 1 inch is very dark gray very channery sandy loam, and the lower 2 inches is grayish brown very channery sandy loam. The subsoil is yellowish brown channery sandy loam and very channery sandy loam. It extends to sandstone at a depth of about 28 inches.

Typically, the surface layer of the Hazleton soil is about 4 inches thick. The upper 1 inch is dark grayish brown channery sandy loam, and the lower 3 inches is yellowish brown channery sandy loam. The subsoil is yellowish brown very channery sandy loam about 29 inches thick. The part of the substratum between depths of 33 and 65 inches is yellowish brown extremely channery loamy sand.

Included with these soils in mapping are small areas of Berks, Lehew, and Shouns soils. Also included are some areas where stones cover more than 3 percent of the surface, small areas where slopes are less than 35 or more than 55 percent, and areas of Rock outcrop. Included areas make up about 20 percent of this map unit.

The available water capacity of the Calvin and Dekalb soils is very low to moderate, and that of the Hazleton soil is low or moderate. Permeability in the Dekalb and Hazleton soils is moderately rapid or rapid, and that in the Calvin soil is moderately rapid. Runoff is very rapid on all three soils. Natural fertility is low. The Calvin soil is strongly acid or very strongly acid. The Dekalb and Hazleton soils are strongly acid to extremely acid. The roots of some plants may be restricted by bedrock at a depth of 20 to 40 inches in the Calvin and Dekalb soils. The depth to bedrock in areas of the Hazleton soil is at least 40 inches.

This unit is used for woodland.

This unit is not suited to cultivated crops or hay and cannot be easily managed for pasture. The slope prevents the safe operation of conventional farm equipment. Erosion is a very severe hazard if the plant cover is removed by overgrazing.

The potential productivity of this unit for trees is moderate to moderately high. The limited depth to bedrock, the low natural fertility, and the droughtiness of the Calvin and Dekalb soils restrict tree growth. The slope prevents the safe operation of logging equipment. Plant competition is a limitation when openings are made in the canopy. Because of the droughtiness of the Calvin and Dekalb soils, seedling mortality also is a limitation. The stones and other rock fragments in the surface layer interfere with the planting of seedlings. Erosion on logging roads and skid trails also is a management concern. It can be controlled by building the roads and trails on the contour. Chestnut oak, Virginia pine, red oak, black oak, and white oak are the dominant species on this unit. American beech, yellow birch, and black cherry also are common in the Big Run and upper Seneca Creek areas.

The slope of all three soils and the limited depth to bedrock in areas of the Calvin and Dekalb soils are the main limitations affecting most urban uses. A soil that is better suited to these uses should be considered.

The capability subclass is VIIs.

CdG—Calvin-Dekalb-Hazleton complex, 55 to 80 percent slopes, stony. These extremely steep, well drained, moderately deep to very deep soils are on hillsides. These soils are along the upper slopes of

Shenandoah Mountain, along the eastern slopes of Timber Ridge, and within the watersheds of Big Run and Seneca Creek. This map unit was delineated only on property managed by the United States Department of Agriculture, Forest Service, or adjacent private land. On most of the private land, these soils are included in unit CdF. Stones cover 1 to 3 percent of the surface. Slopes commonly are dissected by drainageways. Outcrops of sandstone are common. This unit is about 45 percent Calvin soil, 20 percent Dekalb soil, 15 percent Hazleton soil, and 20 percent other soils and Rock outcrop. The Calvin, Dekalb, and Hazleton soils occur as areas so closely intermingled on the landscape that it was not practical to map them separately.

Typically, the surface layer of the Calvin soil is dark reddish brown channery silt loam about 2 inches thick. The subsoil is reddish brown channery and very channery silt loam about 16 inches thick. The substratum is reddish brown extremely channery silt loam. It extends to bedrock at a depth of about 23 inches.

Typically, the surface layer of the Dekalb soil is about 3 inches thick. The upper 1 inch is very dark gray very channery sandy loam, and the lower 2 inches is grayish brown very channery sandy loam. The subsoil is yellowish brown channery sandy loam and very channery sandy loam. It extends to sandstone at a depth of about 27 inches.

Typically, the surface layer of the Hazleton soil is about 3 inches thick. The upper 1 inch is dark grayish brown channery sandy loam, and the lower 2 inches is yellowish brown channery sandy loam. The subsoil is yellowish brown very channery sandy loam about 28 inches thick. The part of the substratum between depths of 31 and 65 inches is yellowish brown extremely channery loamy sand.

Included with these soils in mapping are small areas of Berks, Lehew, and Shouns soils and some areas where stones cover more than 3 percent of the surface. Also included are small areas of less sloping soils and Rock outcrop. Included areas make up about 20 percent of this map unit.

The available water capacity of the Calvin and Dekalb soils is very low to moderate, and that of the Hazleton soil is low or moderate. Permeability in the Dekalb and Hazleton soils is moderately rapid or rapid, and that in the Calvin soil is moderately rapid. Runoff is very rapid on all three soils. Natural fertility is low. The Calvin soil is strongly acid or very strongly acid. The Dekalb and Hazleton soils are strongly acid to extremely acid. The roots of some plants may be restricted by bedrock at a depth of 20 to 40 inches in the Calvin and Dekalb soils. The depth to bedrock in areas of the Hazleton soil is at least 40 inches.

This unit is used for woodland.

This unit is not suited to cultivated crops, hay, or pasture. The slope prevents the safe operation of conventional farm equipment. The hazard of erosion is very severe in unprotected areas.

The potential productivity of this unit for trees is moderate to moderately high. The limited depth to bedrock, the low natural fertility, and the droughtiness of the Calvin and Dekalb soils restrict tree growth. The slope is the main limitation on this unit. Operating conventional harvesting equipment is unsafe. Alternative methods of logging, such as cable logging, are needed. Construction of logging roads and skid trails is not recommended because of the hazard of erosion and the unsafe operating conditions. Plant competition is a limitation when openings are made in the canopy. Because of the droughtiness of the Calvin and Dekalb soils, seedling mortality also is a limitation. The stones and other rock fragments in the surface layer interfere with the planting of seedlings. Chestnut oak, Virginia pine, red oak, black oak, and white oak are the dominant species on this unit. American beech, yellow birch, and black cherry also are common in the Big Run and upper Seneca Creek areas.

The slope prohibits the use of this unit for dwellings, sanitary facilities, and local roads and streets. The depth to bedrock in areas of the Calvin and Dekalb soils also is a limitation.

The capability subclass is VIIs.

CeC—Cateache silt loam, 8 to 15 percent slopes. This soil is strongly sloping, well drained, and moderately deep. It is on benches and ridgetops in the mountains west of the North Fork of the South Branch of the Potomac River. Slopes are generally smooth.

Typically, the surface layer is dark brown silt loam about 3 inches thick. The subsoil is about 18 inches thick. The upper 5 inches is dark reddish brown silt loam, and the lower 13 inches is reddish brown channery silt loam. The substratum is reddish brown extremely channery silt loam. It extends to bedrock at a depth of about 27 inches.

Included with this soil in mapping are a few areas of Shouns and Belmont soils, a few areas of stony soils, a few areas where slopes are less than 8 or more than 15 percent, and a few areas of soils that are less than 20 inches deep over bedrock. Included areas make up about 25 percent of this map unit.

The available water capacity of the Cateache soil is low or moderate, and permeability is moderate. Natural fertility is medium. Runoff is rapid. This soil generally is moderately acid to very strongly acid in the surface layer and subsoil and moderately acid or strongly acid in the substratum. Some areas have been limed. The surface layer in these areas is slightly acid or neutral. The roots of some plants are restricted by bedrock at a depth of 20 to 40 inches.

Most areas of this soil are used for woodland. Other areas are used for hay and pasture.

This soil is suited to cultivated crops, but early maturing varieties should be selected for planting. Early frost is common because of the high elevation. Erosion is a severe hazard in unprotected areas. Including hay in the crop rotation, applying a system of conservation tillage, farming on the contour, growing cover crops and green manure crops, contour stripcropping, returning crop residue to the soil, and establishing grassed waterways for the safe removal of concentrated runoff help to control erosion and maintain tilth.

This soil is suited to hay and pasture. Erosion is a severe hazard if the plant cover is removed by overgrazing. Because of a history of pond failures in areas of this soil, alternative water sources are needed for livestock. A planned grazing system that includes rotational grazing, proper stocking rates, and cutting of hay at the proper stages of maturity help to control erosion and maintain the desirable species of plants.

Most of the acreage is wooded. The potential productivity of this soil for trees is moderately high. Few limitations affect woodland management, but plant competition is moderate when openings are made in the canopy. Erosion on logging roads and skid trails also is a management concern. It can be controlled by building the roads and trails on the contour. Red oak, white oak, sugar maple, and black cherry are the dominant species. Black locust and cucumbertree also are common.

The slope, the depth to bedrock, and a moderate shrink-swell potential are limitations on sites for dwellings. The bedrock generally can be ripped with earth-moving equipment. The dwellings should be designed so that they conform to the natural slope of the land. The less sloping areas are the best sites for dwellings. Extra reinforcement can help footings and foundations to withstand the pressure exerted as the soil swells during wet periods. Also, adding porous backfill adjacent to basement walls helps to reduce this pressure. The deeper included soils may be available for building site development. Establishing a plant cover and controlling runoff help to prevent excessive erosion on construction sites.

The slope, the shrink-swell potential, and frost action are the main limitations on sites for local roads and streets. Providing suitable subgrade or base material can help to prevent the road damage caused by shrinking and swelling and frost action. Building the roads on the contour helps to overcome the slope.

The depth to bedrock is the main limitation on sites for septic tank absorption fields. The limited depth to bedrock reduces the capacity of the soils to store effluent from the septic tank system. The deeper included soils may be available for use as sites for septic tank absorption fields. Installing the absorption fields on the contour results in a more even distribution of effluent.

The capability subclass is IIIe.

CfC—Cateache channery silt loam, 3 to 15 percent slopes, stony. This soil is gently sloping or strongly sloping, well drained, and moderately deep. It is on benches and ridgetops in the mountains west of the North Fork of the South Branch of the Potomac River. Stones cover 1 to 3 percent of the surface. Slopes are generally smooth.

Typically, the surface layer is dark brown channery silt loam about 3 inches thick. The subsoil is about 18 inches thick. The upper 5 inches is dark reddish brown silt loam, and the lower 13 inches is reddish brown channery silt loam. The substratum is reddish brown extremely channery silt loam. It extends to bedrock at a depth of about 27 inches.

Included with this soil in mapping are a few areas of Shouns and Belmont soils, a few areas of nonstony or very stony soils, a few areas where slopes are more than 15 percent, and a few areas of soils that are less than 20 inches deep over bedrock. Included areas make up 20 percent of this map unit.

The available water capacity of the Cateache soil is low or moderate, and permeability is moderate. Natural fertility is medium. Runoff is medium or rapid. This soil is moderately acid to very strongly acid in the surface layer and subsoil and moderately acid or strongly acid in the substratum. The roots of some plants are restricted by bedrock at a depth of 20 to 40 inches.

Most areas of this soil are used for woodland. A few areas are used for pasture.

This unit is not suited to cultivated crops because of the surface stoniness. Areas that are cleared of stones are suited to hay, but the stones beneath the surface would interfere with cultivation of crops.

This unit is suited to pasture. The stones interfere with clipping. Erosion is a moderate or severe hazard if the plant cover is removed by overgrazing. Because of a history of pond failures in areas of this unit, alternative water-supply systems are needed for livestock. A planned grazing system that includes rotational grazing, proper stocking rates, and brush management help to control erosion and maintain the desirable species of plants.

The potential productivity of this soil for trees is moderately high. Few limitations affect woodland management, but plant competition is moderate when openings are made in the canopy. Erosion on logging roads and skid trails also is a management concern. It can be controlled by building the roads and trails on the contour. Red oak, white oak, sugar maple, and black cherry are the dominant species. Black locust and cucumbertree also are common.

A moderate shrink-swell potential and slopes of more than 8 percent are limitations on sites for dwellings. The depth to bedrock also is a limitation, especially on sites for dwellings with basements. The stones interfere with the establishment of lawns and with landscaping. The bedrock generally can be ripped with earth-moving equipment. The dwellings should be designed so that they conform to the natural slope of the land. The less sloping areas are the best sites for dwellings. Extra reinforcements can help footings and foundations to withstand the pressure exerted as the soils swell during wet periods. Also, adding porous backfill adjacent to basement walls helps to reduce this pressure. The deeper included soils may be available for building site development. Establishing a plant cover and controlling runoff help to prevent excessive erosion on construction sites.

The slope, the shrink-swell potential, and frost action are the main limitations on sites for local roads and streets. Providing suitable subgrade or base material can help to prevent the road damage caused by shrinking and swelling and frost action. Building the roads on the contour helps to overcome the slope.

The depth to bedrock is the main limitation on sites for septic tank absorption fields. The depth to bedrock limits the capacity of the soils to store effluent from septic tank systems. The deeper included soils may be available for use as sites for septic tank absorption fields. Installing the absorption fields on the contour results in a more even distribution of effluent.

The capability subclass is VIs.

CfE—Cateache channery silt loam, 15 to 35 percent slopes, stony. This soil is moderately steep or steep, well drained, and moderately deep. It is on hillsides west of the North Fork of the South Branch of the Potomac River. Stones cover 1 to 3 percent of the surface. Outcrops of rock and escarpments are common. Slopes commonly are dissected by drainageways.

Typically, the surface layer is dark brown channery silt loam about 3 inches thick. The subsoil is about 17 inches thick. The upper 5 inches is dark reddish brown silt loam, and the lower 12 inches is reddish brown channery silt loam. The substratum is reddish brown extremely channery silt loam. It extends to bedrock at a depth of about 25 inches.

Included with this soil in mapping are a few areas of Shouns and Belmont soils, a few areas of nonstony or very stony soils, a few areas where slopes are more than 35 percent, a few areas of soils that are less than 20 inches deep over bedrock, and areas of Rock outcrop. Included areas make up about 30 percent of this map unit.

The available water capacity of the Cateache soil is low or moderate, and permeability is moderate. Natural fertility is medium. Runoff is rapid or very rapid. This soil is moderately acid to very strongly acid in the surface layer and subsoil and moderately acid or strongly acid in the substratum. The roots of some plants are restricted by bedrock at a depth of 20 to 40 inches.

Most areas of this soil are used for woodland. A few areas are used for pasture.

This unit is not suited to cultivated crops because of the surface stoniness and the slope. The less sloping areas that are cleared of stones are suited to hay, but the stones beneath the surface would interfere with cultivation of crops.

This unit cannot be easily managed for pasture. The slope is the main limitation. The surface stoniness also is a limitation. Operating the conventional equipment used in clipping and in applying fertilizer is unsafe in the steeper areas. Erosion is a severe hazard if the plant cover is removed by overgrazing. A planned grazing system that includes rotational grazing, proper stocking rates, and brush management help to control erosion and maintain the desirable species of plants.

The potential productivity of this soil for trees is moderately high. The slope and slippage limit the use of equipment. Erosion on logging roads and skid trails also is a management concern. It can be controlled by building the roads and trails on the contour. Plant competition is moderate when openings are made in the canopy. Seedling mortality is a management concern on south aspects. Red oak, white oak, sugar maple, and black cherry are the dominant species. Black locust and cucumbertree also are common.

The slope is the main limitation affecting most urban uses. A moderate shrink-swell potential, the depth to bedrock, and slippage also are limitations. A soil that is better suited to urban uses should be considered.

The capability subclass is VIIs.

CfF—Cateache channery silt loam, 35 to 55 percent slopes, stony. This soil is very steep, well drained, and moderately deep. It is on hillsides west of the North Fork of the South Branch of the Potomac River. Stones cover 1 to 3 percent of the surface. Outcrops of rock and escarpments are common. Slopes commonly are dissected by drainageways.

Typically, the surface layer is dark brown channery silt loam about 2 inches thick. The subsoil is about 18 inches thick. The upper 6 inches is dark reddish brown silt loam, and the lower 12 inches is reddish brown channery silt loam. The substratum is reddish brown extremely channery silt loam. It extends to bedrock at a depth of about 24 inches.

Included with this soil in mapping are a few areas of Shouns and Belmont soils, a few areas of nonstony or very stony soils, a few areas where slopes are less than 35 or more than 55 percent, a few areas of soils that are less than 20 inches deep over bedrock, and areas of Rock outcrop. Included areas make up about 30 percent of this map unit.

The available water capacity of the Cateache soil is low or moderate, and permeability is moderate. Natural fertility is medium. Runoff is very rapid. This soil is moderately acid to very strongly acid in the surface layer and subsoil and moderately acid or strongly acid in the substratum. The roots of some plants are restricted by bedrock at a depth of 20 to 40 inches.

Most areas of this soil are used for woodland. A few areas are used for pasture.

This soil is not suited to cultivated crops or hay. The slope prevents the safe operation of conventional farm equipment.

This soil cannot be easily managed for pasture. The slope prevents the safe operation of the conventional equipment used in clipping and in applying fertilizer. The hazard of erosion is very severe.

The potential productivity of this soil for trees is moderately high. The slope prevents the safe operation of equipment. Slippage is a hazard. Erosion on logging roads and skid trails also is a management concern. It can be controlled by building the roads and trails on the contour. Plant competition is moderate when openings are made in the canopy. Seedling mortality is a management concern on south aspects. Red oak, white oak, sugar maple, and black cherry are the dominant species. Black locust and cucumbertree also are common.

The slope is the main limitation on sites for dwellings, sanitary facilities, and local roads and streets. A moderate shrink-swell potential, the depth to bedrock, and slippage also are limitations. A soil that is better suited to these urban uses should be considered.

The capability subclass is VIIs.

CfG—Cateache channery silt loam, 55 to 80 percent slopes, stony. This soil is extremely steep, well drained, and moderately deep. It is on hillsides west of the North Fork of the South Branch of the Potomac River. This map unit was delineated only on maps of land managed by the United States Department of Agriculture, Forest Service, or adjacent private land. On most of the private land, this soil is included in unit CfF. Stones cover 1 to 3 percent of the surface. Outcrops of rock and escarpments are common. Slopes commonly are dissected by drainageways.

Typically, the surface layer is dark brown channery silt loam about 2 inches thick. The subsoil is about 18 inches thick. The upper 6 inches is dark reddish brown silt loam, and the lower 12 inches is reddish brown channery silt loam. The substratum is reddish brown extremely channery silt loam. It extends to bedrock at a depth of about 23 inches.

Included with this soil in mapping are a few areas of Shouns and Belmont soils, a few areas of nonstony or very stony soils, a few areas where slopes are less than 55 percent, a few areas of soils that are less than 20 inches deep over bedrock, and areas of Rock outcrop. Included areas make up about 30 percent of this map unit.

The available water capacity of the Cateache soil is low or moderate, and permeability is moderate. Natural fertility is medium. Runoff is very rapid. This soil is moderately acid to very strongly acid in the surface layer and subsoil and moderately acid or strongly acid in the substratum. The roots of some plants may be restricted by bedrock at a depth of 20 to 40 inches.

This soil is used almost exclusively for woodland. It is not suited to cultivated crops, hay, or pasture. The slope prevents the use of conventional farm equipment. The hazard of erosion is very severe.

The potential productivity of this soil for trees is moderately high. The slope is the main limitation. Operating conventional harvesting equipment is unsafe on this unit. Alternative methods of logging, such as cable logging, are needed. Construction of logging roads and skid trails is not recommended because of the hazard of erosion, slippage, and the unsafe operating conditions. Plant competition is moderate when openings are made in the canopy. Seedling mortality is a management concern on south aspects. Red oak, white oak, sugar maple, and black cherry are the dominant species. Black locust and cucumbertree also are common.

The slope prohibits the use of this soil for dwellings, sanitary facilities, and local roads and streets. A moderate shrink-swell potential, the depth to bedrock, and slippage also are limitations.

The capability subclass is VIIs.

Ch—Chagrin loam. This soil is very deep, nearly level, and well drained. It is on the flood plains along the major streams in the eastern three-fourths of the county. It is occasionally flooded. The slope ranges from 0 to 3 percent.

Typically, the surface layer is very dark grayish brown loam about 12 inches thick. The subsoil is dark brown loam about 14 inches thick. The part of the substratum between depths of 26 and 43 inches is dark brown fine sandy loam, and the part between depths of 43 to 65 inches is brown very gravelly sandy loam.

Included with this soil in mapping are a few areas of Lobdell and Tioga soils. Also included are a few areas of soils that have a reddish brown or very gravelly subsoil. Included soils make up about 20 percent of this map unit.

The available water capacity of the Chagrin soil is high, and permeability is moderate. Runoff is medium. Natural fertility is high. This soil is moderately acid to neutral. The surface layer is friable and can be easily tilled. The rooting depth is at least 40 inches. The depth to bedrock is more than 60 inches.

Most areas of this soil are used for cultivated crops or hay. Other areas are used for pasture or for home gardens.

This soil is suited to cultivated crops. It is one of the best soils in the county for the production of the commonly grown crops. The crops can be damaged by the periodic flooding. Cultivated crops can be grown year after year, but a protective cover crop is needed. Including hay in the crop rotation, applying a system of conservation tillage, growing green manure crops, and returning crop residue to the soil help to control erosion and maintain tilth.

This soil is suited to hay and pasture. Debris is deposited on grassland during periods of flooding. A planned grazing system that includes rotational grazing, proper stocking rates, and cutting of hay at the proper stages of maturity help to control erosion and maintain the desirable species of plants.

The potential productivity of this soil for trees is moderately high. Few limitations affect woodland management, but the high natural fertility causes severe plant competition when cropland is converted to woodland. Red oak, yellow poplar, sugar maple, white oak, black cherry, and black walnut are the dominant species.

The flooding is the major hazard on sites for dwellings and septic tank absorption fields. A soil that is better suited to these uses should be considered. Excessive erosion and stream scouring on construction sites can be prevented by establishing a plant cover and controlling runoff.

The flooding is the major hazard on sites for local roads and streets. Constructing the roads and streets on raised fill material reduces the risk of damage from flooding.

The capability subclass is IIw.

CkB—Clarksburg channery silt loam, 3 to 8 percent slopes. This soil is very deep, gently sloping, and moderately well drained. It is on foot slopes, in coves, along drainageways, and on benches. Seep spots are common during wet months in winter and spring.

Typically, the surface layer is dark grayish brown channery silt loam about 7 inches thick. The subsoil is about 37 inches thick. The upper 11 inches is yellowish brown and strong brown channery silt loam. The next 6 inches is strong brown channery silty clay loam. The lower 20 inches is yellowish red, firm, very firm, and brittle channery silty clay loam mottled with yellowish brown, pale brown, and light gray. The part of the substratum between depths of 44 and 65 inches is strong brown very channery silty clay loam mottled with light gray and red.

Included with this soil in mapping are a few areas of Buchanan, Ernest, and Toms soils, a few small areas where slopes are more than 8 percent, a few areas of stony soils, and a few areas of soils that have a reddish brown subsoil. Also included are some areas of soils that have more clay in the subsoil than the Clarksburg soil. Included soils make up 30 percent of this map unit.

The Clarksburg soil has a moderate available water capacity. It has a fragipan. Permeability is moderate above the fragipan and moderately slow or slow in it. Runoff is medium. Natural fertility also is medium. This soil generally is strongly acid to slightly acid. Many areas have been limed. The surface layer in these areas is neutral. The seasonal high water table rises to about 1.5 feet from the surface during wet periods. The water table and the fragipan restrict the rooting depth of some plants. The depth to bedrock is more than 60 inches.

Most areas of this soil are used for pasture and hay. A few areas are used for cultivated crops or woodland.

This soil is suited to cultivated crops. Erosion is a moderate hazard in unprotected areas. The wetness often delays spring planting. Because of the restricted rooting depth, some plants are adversely affected by a shortage of water as the soil dries out during summer. Including hay in the crop rotation, applying a system of conservation tillage, farming on the contour, growing cover crops and green manure crops, and returning crop residue to the soil help to control erosion and maintain tilth.

This soil is suited to hay and pasture. It is better suited to grasses than legumes because of the seasonal high water table. Because the soil is soft when wet, grazing early in spring damages the sod. Erosion is a moderate hazard if the plant cover is removed by overgrazing. A planned grazing system that includes rotational grazing, proper stocking rates, deferment of spring grazing until the soil is firm, and cutting of hay at the proper stages of maturity help to control erosion and maintain the desirable species of plants.

The potential productivity of this soil for trees is moderately high. Plant competition is moderate when openings are made in the canopy. Erosion on logging roads and skid trails also is a management concern. It can be controlled by building the roads and trails on the contour. The use of equipment is restricted during wet periods because the soil is soft when wet. Red oak, white oak, black walnut, and redcedar are the dominant species.

The seasonal high water table is the main limitation on sites for dwellings, especially for dwellings with basements. Installing footer drains and waterproofing walls help to keep basements dry. The well drained included soils are better sites for dwellings. Establishing a plant cover and controlling runoff help to prevent excessive erosion on construction sites.

The seasonal high water table and low strength are limitations on sites for local roads and streets. Because this soil is soft when wet, the pavement cracks under heavy loads. Constructing the roads on raised fill material and installing a drainage system help to overcome the limitations.

The seasonal high water table and the moderately slow or slow permeability are limitations on sites for septic tank absorption fields. In a few areas the better drained, more rapidly permeable included soils are available for use as sites for septic tank absorption fields. Installing deep drainage tile upslope from the absorption field can be effective in lowering the seasonal high water table. Installing large absorption fields on the contour helps to overcome the slow permeability.

The capability subclass is IIe.

CkC—Clarksburg channery silt loam, 8 to 15 percent slopes. This soil is very deep, strongly sloping, and moderately well drained. It is on foot slopes, in coves, along drainageways, and on benches. Seep spots are common during wet months in winter and spring.

Typically, the surface layer is dark grayish brown channery silt loam about 6 inches thick. The subsoil is about 38 inches thick. The upper 10 inches is yellowish brown and strong brown channery silt loam. The next 5 inches is strong brown channery silty clay loam. The lower 23 inches is yellowish red, firm, very firm, and brittle channery silty clay loam mottled with yellowish brown, pale brown, and light gray. The part of the substratum between depths of 44 and 65 inches is strong brown very channery silty clay loam mottled with light gray and red.

Included with this soil in mapping are a few areas of Buchanan, Ernest, and Toms soils, a few small areas where slopes are more than 15 percent, a few areas of stony soils, and a few areas of soils that have a reddish brown subsoil. Also included are some areas of soils that have more clay in the subsoil than the Clarksburg soil. Included soils make up about 30 percent of this map unit.

The Clarksburg soil has a moderate available water capacity. It has a fragipan. Permeability is moderate above the fragipan and moderately slow or slow in it. Runoff is rapid. Natural fertility is medium. This soil generally is strongly acid to slightly acid. Many areas have been limed. The surface layer in these areas is neutral. The seasonal high water table rises to about 1.5 feet from the surface during wet periods. The water table and the fragipan restrict the rooting depth of some plants. The depth to bedrock is more than 60 inches.

Most areas of this soil are used for pasture and hay. A few areas are used for cultivated crops or woodland.

This soil is suited to cultivated crops. Erosion is a severe hazard in unprotected areas. The wetness often delays spring planting. Because of the restricted rooting depth, some plants are adversely affected by a shortage of water as the soil dries out during summer. Including hay in the crop rotation, applying a system of conservation tillage, farming on the contour, growing cover crops and green manure crops, contour stripcropping, returning crop residue to the soil, and establishing grassed waterways for the safe removal of concentrated runoff help to control erosion and maintain tilth.

This soil is suited to hay and pasture. It is better suited to grasses than legumes because of the seasonal high water table. Because the soil is soft when wet, grazing early in spring damages the sod. Erosion is a severe hazard if the plant cover is removed by overgrazing. A planned grazing system that includes rotational grazing, proper stocking rates, deferment of spring grazing until the soil is firm, and cutting of hay at the proper stages of maturity help to control erosion and maintain the desirable species of plants.

The potential productivity of this soil for trees is moderately high. Plant competition is moderate when openings are made in the canopy. Erosion on logging roads and skid trails also is a management concern. It can be controlled by building the roads and trails on the contour. The use of equipment is restricted during wet periods because the soil is soft when wet. Red oak, white oak, black walnut, and redcedar are the dominant species.

The seasonal high water table is the main limitation on sites for dwellings, especially for dwellings with basements. The slope also is a limitation. Installing footer drains and waterproofing walls help to keep basements dry. The well drained included soils are better sites for dwellings. The dwellings should be designed so that they conform to the natural slope of the land. The more gently sloping areas are the best sites for dwellings. Establishing a plant cover and controlling runoff help to prevent excessive erosion on construction sites.

The seasonal high water table, low strength, and the slope are limitations on sites for local roads and streets. Because the soil is soft when wet, the pavement cracks under heavy loads. Constructing the roads on raised fill material and installing a drainage system help to overcome the limitations. Building the roads and streets on the contour helps to overcome the slope.

The seasonal high water table and the moderately slow or slow permeability are limitations on sites for septic tank absorption fields. In a few areas the better drained, more rapidly permeable included soils are available for use as sites for septic tank absorption fields. Installing deep drainage tile upslope from the absorption field can be effective in lowering the seasonal high water table. Installing large absorption fields on the contour helps to overcome the slow permeability.

The capability subclass is IIIe.

ClC—Clarksburg channery silt loam, 3 to 15 percent slopes, stony. This soil is very deep, strongly sloping or gently sloping, and moderately well drained. It is on foot slopes, in coves, along drainageways, and on benches. Stones cover 1 to 3 percent of the surface. Seep spots are common during wet months in winter and spring.

Typically, the surface layer is dark grayish brown channery silt loam about 6 inches thick. The subsoil is about 37 inches thick. The upper 11 inches is yellowish brown and strong brown channery silt loam. The next 6 inches is strong brown channery silty clay loam. The lower 20 inches is yellowish red, firm, very firm, and brittle channery silty clay loam mottled with yellowish brown, pale brown, and light gray. The part of the substratum between depths of 43 and 65 inches is strong brown very channery silty clay loam mottled with light gray and red.

Included with this soil in mapping are a few areas of Buchanan, Ernest, and Toms soils, a few areas where slopes are more than 15 percent, and a few areas of nonstony or very stony soils. Also included are a few areas of soils that have a reddish brown or silty clay subsoil or that do not have a very firm and brittle subsoil. Included soils make up about 30 percent of this map unit.

The Clarksburg soil has a moderate available water capacity. It has a fragipan. Permeability is moderate above the fragipan and moderately slow or slow in it. Runoff is rapid or medium. Natural fertility is medium. This soil generally is strongly acid to slightly acid. Some areas have been limed. The surface layer in these areas is neutral. The seasonal high water table rises to about 1.5 feet from the surface during wet periods. The water table and the fragipan restrict the rooting depth of some plants. The depth to bedrock is more than 60 inches.

Most areas of this soil are used for pasture. Other areas are wooded.

This soil is not suited to cultivated crops because of the surface stoniness. Areas that are cleared of stones are suited to hay, but the stones beneath the surface would interfere with cultivation of crops.

This soil is suited to pasture. It is better suited to grasses than legumes because of the seasonal high water table. The stones interfere with clipping. Because the soil is soft when wet, grazing early in spring damages the sod. Erosion is a severe or moderate hazard if the plant cover is removed by overgrazing. A planned grazing system that includes rotational grazing, proper stocking rates, deferment of spring grazing until the soil is firm, and brush management help to control erosion and maintain the desirable species of plants.

The potential productivity of this soil for trees is moderately high. Plant competition is moderate when openings are made in the canopy. Erosion on logging roads and skid trails also is a management concern. It can be controlled by building the roads and trails on the contour. The use of equipment is restricted during wet periods because the soil is soft when wet. Red oak, white oak, black walnut, and redcedar are the dominant species.

The seasonal high water table is the main limitation on sites for dwellings, especially for dwellings with basements. The slope also is a limitation. The stones interfere with the establishment of lawns and with landscaping. Installing footer drains and waterproofing walls help to keep basements dry. The well drained included soils are better sites for dwellings. The dwellings should be designed so that they conform to the natural slope of the land. The more gently sloping areas are the best sites for dwellings. Stones can be removed from lawn areas. Establishing a plant cover and controlling runoff help to prevent excessive erosion on construction sites.

The seasonal high water table, low strength, and slopes of more than 8 percent are limitations on sites for local roads and streets. Because the soil is soft when wet, the pavement cracks under heavy loads. Constructing the roads on raised fill material and installing a drainage system help to overcome the limitations. Building the roads and streets on the contour helps to overcome the slope.

The seasonal high water table and the moderately slow or slow permeability are limitations on sites for septic tank absorption fields. In a few areas the better drained, more rapidly permeable included soils are available for use as sites for septic tank absorption fields. Installing deep drainage tile upslope from the absorption fields can be effective in lowering the seasonal high water table. Installing large absorption fields on the contour helps to overcome the slow permeability.

The capability subclass is VIs.

ClD—Clarksburg channery silt loam, 15 to 25 percent slopes, stony. This soil is very deep, moderately steep, and moderately well drained. It is on foot slopes, in coves, along drainageways, and on benches. Stones cover 1 to 3 percent of the surface. Seep spots are common during wet months in winter and spring.

Typically, the surface layer is dark grayish brown channery silt loam about 5 inches thick. The subsoil is about 37 inches thick. The upper 11 inches is yellowish brown and strong brown channery silt loam. The next 6 inches is strong brown channery silty clay loam. The lower 20 inches is yellowish red, firm, very firm, and brittle channery silty clay loam mottled with yellowish brown, pale brown, and light gray. The part of the substratum between depths of 42 and 65 inches is strong brown very channery silty clay loam mottled with light gray and red.

Included with this soil in mapping are a few areas of Buchanan and Ernest soils, a few areas where slopes are more than 25 percent, and a few areas of nonstony or very stony soils. Also included are a few areas of soils that have a reddish brown or silty clay subsoil or that do not have a very firm and brittle subsoil. Included soils make up about 35 percent of this map unit.

The Clarksburg soil has a moderate available water capacity. It has a fragipan. Permeability is moderate above the fragipan and moderately slow or slow in it. Runoff is rapid. Natural fertility is medium. This soil generally is strongly acid to slightly acid. Some areas have been limed. The surface layer in these areas is neutral. The seasonal high water table rises to about 1.5 feet from the surface during wet periods. The water table and the fragipan restrict the rooting depth of some plants. The depth to bedrock is more than 60 inches.

Most areas of this soil are used for pasture. Other areas are wooded.

This soil is not suited to cultivated crops because of the surface stoniness. Areas that are cleared of stones are suited to hay, but the stones beneath the surface would interfere with cultivation of crops.

This soil is suited to pasture. It is better suited to grasses than legumes because of the seasonal high water table. The stones interfere with clipping. Because the soil is soft when wet, grazing early in spring damages the sod. Erosion is a severe hazard if the plant cover is removed by overgrazing. A planned grazing system that includes rotational grazing, proper stocking rates, deferment of spring grazing until the soil is firm, and brush management help to control erosion and maintain the desirable species of plants.

The potential productivity of this soil for trees is moderately high. Plant competition is moderate when openings are made in the canopy. Erosion on logging roads and skid trails also is a management concern. It can be controlled by building the roads and trails on the contour. The use of equipment is restricted during wet periods because the soil is soft when wet. Seedling mortality is a management concern on south aspects. Red oak, white oak, black walnut, and redcedar are the dominant species.

The slope and the seasonal high water table are the main limitations on sites for dwellings, especially for dwellings with basements. The stones interfere with the establishment of lawns and with landscaping. Installing footer drains and waterproofing walls help to keep basements dry. The included soils that are better drained and less sloping are better sites for dwellings. The dwellings should be designed so that they conform to the natural slope of the land. Land shaping and grading help to overcome the slope. Stones can be removed from lawn areas. Establishing a plant cover and controlling runoff help to prevent excessive erosion on construction sites.

The slope is the main limitation on sites for local roads and streets. The seasonal high water table and low strength also are limitations. Because the soil is soft when wet, the pavement cracks under heavy loads. Constructing the roads on raised fill material and installing a drainage system help to overcome the limitations. Building the roads and streets on the contour helps to overcome the slope.

The slope, the seasonal high water table, and the moderately slow or slow permeability are limitations on sites for septic tank absorption fields. In a few areas the better drained, more rapidly permeable included soils are available for use as sites for septic tank absorption fields. Installing deep drainage tile upslope from the absorption field can be effective in lowering the seasonal high water table. Installing large absorption fields on the contour and selecting the more gently sloping areas help to overcome the slow permeability and the slope.

The capability subclass is VIs.

DeF—Dekalb-Elliber-Blackthorn association, 35 to 55 percent slopes, stony. These very deep and moderately deep, well drained, very steep soils are on hillsides. The Blackthorn soils typically are on the lower slopes of hillsides, and the Dekalb and Elliber soils typically are on the upper slopes. Stones cover 1 to 3 percent of the surface. Outcrops of rock are common in areas of the Dekalb soil. This unit is in a wide band that is oriented in a north-south direction across the central part of the county. It is in forested mountainous areas. The unit is about 40 percent Dekalb soil, 20 percent Elliber soil, 20 percent Blackthorn soil, and 20 percent other soils and Rock outcrop.

Typically, the surface layer of the Dekalb soil is about 3 inches thick. The upper 1 inch is very dark gray very channery sandy loam, and the lower 2 inches is grayish brown very channery sandy loam. The subsoil is yellowish brown channery sandy loam and very channery sandy loam. It extends to sandstone at a depth of about 28 inches.

Typically, the surface layer of the Elliber soil is about 8 inches thick. The upper 4 inches is very dark gray extremely channery loam, and the lower 4 inches is light brownish gray extremely channery sandy loam about 4 inches thick. The subsoil is 57 inches or more thick. The upper 7 inches is brownish yellow extremely channery loam, and the lower 50 inches or more is light yellowish brown extremely channery loam.

Typically, the surface layer of the Blackthorn soil is about 5 inches thick. The upper 1 inch is very dark grayish brown channery sandy loam, and the lower 4 inches is yellowish brown channery sandy loam. The subsoil is 67 inches or more thick. The upper 48 inches is light yellowish brown, yellowish brown, or brownish yellow very channery sandy loam and very channery loam, and the lower 19 inches or more is yellowish red clay.

Included with this unit in mapping are a few small areas of Hazleton, Laidig, and Opequon soils. Also included are a few small areas where slopes are less than 35 percent, a few small areas of Rock outcrop, a few small areas that have more sand in the subsoil than the Dekalb, Elliber, and Blackthorn soils, and several areas where stones cover more than 3 percent of the surface. In some places are soils that are similar to the Dekalb soil but are slightly acid or neutral in the lower part of the subsoil. Included areas generally make up about 20 percent of this map unit, but the percentage is higher in the very stony areas.

The available water capacity of the Dekalb soil is very low to moderate, that of the Blackthorn soil is moderate, and that of the Elliber soil is low or moderate. Permeability of the Dekalb and Elliber soils is moderately rapid or rapid, and that of the Blackthorn soil is moderate or moderately rapid in the upper part of the subsoil and moderate or moderately slow in the lower part. Runoff is very rapid on all three soils. Natural fertility of the Dekalb soil is low, that of the Elliber soil is medium, and that of the Blackthorn soil is low in the surface layer and the upper part of the subsoil and medium in the lower part of the subsoil. The Dekalb and Elliber soils are extremely acid to strongly acid. The Blackthorn soil is moderately acid to very strongly acid in the surface layer and the upper part of the subsoil and is strongly acid or very strongly acid in the lower part of the subsoil. The roots of some plants are restricted by bedrock at a depth of 20 to 40 inches in the Dekalb soil. The depth to bedrock is more than 60 inches in the Elliber and Blackthorn soils.

This unit is used almost entirely for woodland. A few small areas are used for pasture.

This unit is not suited to cultivated crops or hay. The slope prevents the safe operation of conventional farm equipment.

This unit cannot be easily managed for pasture. The slope prevents the safe operation of the conventional equipment used in clipping and in applying fertilizer. Erosion is a very severe hazard.

The potential productivity of this unit for trees is moderate to moderately high. The limited depth to bedrock, the low natural fertility, and the droughtiness of the Dekalb soil restrict tree growth. The slope prevents the safe operation of logging equipment. Plant competition is a limitation when openings are made in the canopy. Seedling mortality also can be a limitation. Erosion on logging roads and skid trails also is a management concern. It can be controlled by building the roads and trails on the contour. The stones and other rock fragments in the surface layer interfere with the planting of seedlings. Red oak, white oak, white pine, and black locust are the dominant species on the Blackthorn and Elliber soils. Chestnut oak and Virginia pine are dominant on the droughty Dekalb soil. Some red oak, black oak, and white oak also are on the Dekalb soil.

The slope is a main limitation on sites for dwellings, local roads and streets, and septic tank absorption fields. The depth to bedrock also is a limitation on the Dekalb soil. This unit is generally not used for urban development. A soil that is better suited should be considered.

The capability subclass is VIIs.

DfG—Dekalb-Elliber association, 55 to 80 percent slopes, stony. These moderately deep and very deep, well drained, extremely steep soils are on hillsides. Stones cover 1 to 3 percent of the surface. Outcrops of rock are common in areas of the Dekalb soil. This unit is in a wide band that is oriented in a north-south direction across the central part of the county. It is in forested mountainous areas. The unit was delineated only on maps of land managed by the United States Department of Agriculture, Forest Service, or adjacent private land. On most of the private land, these soils are included in unit DeF. This unit is about 55 percent Dekalb soil, 25 percent Elliber soil, and 20 percent other soils and Rock outcrop.

Typically, the surface layer of the Dekalb soil is about 3 inches thick. The upper 1 inch is very dark gray very channery sandy loam, and the lower 2 inches is grayish brown very channery sandy loam. The subsoil is yellowish brown channery sandy loam and very channery sandy loam. It extends to sandstone at a depth of about 27 inches.

Typically, the surface layer of the Elliber soil is about 7 inches thick. The upper 2 inches is very dark gray extremely channery loam, and the lower 5 inches is light brownish gray extremely channery sandy loam. The thickness of the subsoil is 58 inches or more. The upper 8 inches is brownish yellow extremely channery loam, and the lower 50 inches or more is light yellowish brown extremely channery loam.

Included with this unit in mapping are a few small areas of Hazleton and Opequon soils, areas where stones cover more than 3 percent of the surface, and areas of Rock outcrop. Also included are a few areas that have more sand in the subsoil than the Dekalb and Elliber soils. Included areas generally make up about 20 percent of the map unit, but the percentage is higher in the very stony areas.

The available water capacity of the Dekalb soil is very low to moderate, and that of the Elliber soil is low or moderate. Permeability in both soils is moderately rapid or rapid. Runoff is very rapid. Natural fertility is low in the Dekalb soil and medium in the Elliber soil. Both soils are extremely acid to strongly acid. The roots of some plants are restricted by bedrock at a depth of 20 to 40 inches in the Dekalb soil. The depth to bedrock is more than 60 inches in the Elliber soil.

This unit is used almost exclusively for woodland. It is not suited to cultivated crops, hay, or pasture. The slope prevents the use of conventional farm equipment. The hazard of erosion is very severe.

The potential productivity of this unit for trees is moderate or moderately high. The limited depth to bedrock, the low natural fertility, and the droughtiness of the Dekalb soil restrict tree growth. The slope is a severe limitation. Operating vehicular equipment is unsafe on this unit. Alternative methods of logging, such as cable logging, are needed. Construction of logging roads and skid trails is not recommended because of the hazard of erosion and the unsafe operating conditions. Plant competition is a limitation when openings are made in the canopy. Seedling mortality also can be a limitation. Erosion is a severe hazard following logging activities. The stones and other rock fragments in the surface layer interfere with the planting of seedlings. Red oak, white oak, white pine, and black locust are the dominant species on the Elliber soil. Chestnut oak and Virginia pine are dominant on the droughty Dekalb soil. Some red oak, black oak, and white oak also are on the Dekalb soil.

The slope prohibits the use of this unit for dwellings, sanitary facilities, and local roads and streets. The depth to bedrock in areas of the Dekalb soil also is a limitation.

The capability subclass is VIIs.

Du—Dunning silt loam. This soil is very deep, nearly level, and very poorly drained or poorly drained. It is on the flood plains of the streams in the eastern three-fourths of the county. Water is commonly ponded on the surface. The soil is occasionally flooded. The slope ranges from 0 to 3 percent.

Typically, the surface layer is about 16 inches thick. The upper 8 inches is black silt loam, and the lower 8 inches is black silty clay loam. The subsoil is about 20 inches thick. The upper 5 inches is dark gray silty clay, and the lower 15 inches is gray clay mottled with yellowish brown and light gray. The part of the substratum between depths of 36 and 65 inches is light gray silty clay loam mottled with brownish yellow and yellowish brown.

Included with this soil in mapping are a few areas of Orrville and Toms soils, a few areas of gently sloping soils, a few areas of soils that do not have a very dark surface layer, and a few areas of soils that have gravelly layers within 40 inches of the surface. Included soils make up about 20 percent of this map unit.

The available water capacity of the Dunning soil is high. Permeability and runoff are slow. Natural fertility is high. This soil is moderately acid to mildly alkaline. A seasonal high water table at or near the surface restricts the rooting depth of some plants. The depth to bedrock is more than 60 inches.

Most areas of this soil are used for pasture. Some areas have been drained, and they are used for hay or cultivated crops. A few areas are wooded.

This soil has limited suitability for cultivated crops. The wetness often delays spring planting. Drainage is difficult because of the clayey subsoil and the slow permeability. The crops can be damaged by the periodic flooding. If this soil is properly drained, crops can be planted year after year, but a protective cover crop is needed. Including hay in the crop rotation, applying a system of conservation tillage, growing green manure crops, returning crop residue to the soil, and deferring spring tillage until the soil is dry help to control erosion and maintain tilth.

This soil is suited to hay and pasture. It is better suited to grasses than legumes because of the seasonal high water table. Unless the soil is artificially drained, harvesting of hay is often limited to the long dry periods. Water tolerant species should be selected for planting. Because the soil is soft when wet, grazing early in spring damages the sod. Debris is deposited on the grassland during periods of flooding. Deferment of spring grazing until the soil is firm, a planned grazing system that includes rotational grazing, proper stocking rates, and cutting of hay at the proper stages of maturity help to control erosion and maintain the desirable species of plants.

The potential productivity of this soil for water tolerant trees is moderately high. Because the soil is soft when wet, the use of vehicular equipment is restricted during wet periods. Plant competition is severe, and seedling mortality is high. Pin oak, American sycamore, and sugar maple are the dominant species.

The flooding and wetness are the main limitations on sites for dwellings. A soil that is better suited to dwellings should be considered. Establishing a plant cover and controlling runoff help to prevent excessive erosion and stream scouring on construction sites.

Low strength, wetness, and flooding are limitations on sites for local roads and streets. Because the soil is soft when wet, the pavement cracks under heavy loads. Constructing the roads on raised fill and installing a drainage system help to overcome the limitations.

The flooding, wetness, and slow permeability are limitations on sites for septic tank absorption fields. A soil that is better suited to these fields should be considered.

The capability subclass is IIIw.

EdC—Edom channery silt loam, 8 to 15 percent slopes. This soil is strongly sloping, well drained, and deep. It is on ridgetops and benches. Slopes are generally smooth. Outcrops of limestone are in a few areas.

Typically, the surface layer is brown channery silt loam about 6 inches thick. The subsoil is yellowish red silty clay loam and channery silty clay about 26 inches thick. The substratum is reddish brown channery silty clay loam. It extends to calcareous shale or limestone at a depth of about 43 inches.

Included with this soil in mapping are several areas of Caneyville soils, several areas of soils that have less clay than the Edom soil, a few areas of gently sloping soils, a few areas of severely eroded soils, and a few areas of soils that have more rock fragments in the subsoil than the Edom soil. Also included are a few areas of stony soils and Rock outcrop. Included areas make up about 35 percent of this map unit.

The available water capacity of the Edom soil is moderate or high, and permeability is moderately slow or moderate. Runoff is rapid. Natural fertility is medium or high. This soil is strongly acid to neutral in the surface layer and the upper part of the subsoil and is moderately acid to mildly alkaline in the lower part of the subsoil and the substratum. The depth to bedrock is 40 to 60 inches.

Most areas of this soil are used for hay and pasture. A few areas are used for cultivated crops or woodland.

This soil is suited to cultivated crops, but erosion is a severe hazard in unprotected areas. Including hay in the crop rotation, applying a system of conservation tillage, farming on the contour, growing cover crops and green manure crops, contour stripcropping, returning crop residue to the soil, and establishing grassed waterways for the safe removal of concentrated runoff help to control erosion and maintain tilth.

This soil is suited to hay and pasture. Erosion is a severe hazard if the plant cover is removed by overgrazing. Because of a history of pond failures in areas of this soil, alternative water sources are needed for livestock. A planned grazing system that includes rotational grazing, proper stocking rates, and cutting of hay at the proper stages of maturity help to control erosion and maintain the desirable species of plants.

The potential productivity of this soil for trees is moderately high. Few limitations affect woodland management, but plant competition is severe when openings are made in the canopy. Erosion on logging roads and skid trails also is a management concern. It can be controlled by building the roads and trails on the contour. Red oak, white oak, black walnut, and redcedar are the dominant species.

The slope and a moderate shrink-swell potential are limitations on sites for dwellings. Excavations for basements often encounter bedrock, but it generally can be ripped with conventional earth-moving equipment. When hard limestone is encountered, building above the bedrock and landscaping with additional fill material may be preferable to excavating the rock. The dwellings should be designed so that they conform to the natural slope of the land. The less sloping areas are the best sites for dwellings. Extra reinforcement can help footings and foundations to withstand the pressure exerted as the soil swells during wet periods. Also, adding porous backfill adjacent to basement walls helps to reduce this pressure. Establishing a plant cover and controlling runoff help to prevent excessive erosion on construction sites.

Low strength is the main limitation on sites for local roads and streets. The slope also is a limitation. Providing suitable subgrade or base material can help to prevent the road damage caused by low strength. Building the roads on the contour helps to overcome the slope.

The moderately slow permeability is the main limitation on sites for septic tank absorption fields. The slope and the depth to bedrock also are limitations. In some areas the underlying limestone is cavernous and can allow the effluent to pollute ground water. Installing large absorption fields on the contour helps to overcome the limited permeability and results in a more even distribution of effluent. In a few areas the deeper included soils are available for use as sites for septic tank absorption fields. The less sloping areas are the best sites for these fields.

The capability subclass is IIIe.

EdD—Edom channery silt loam, 15 to 25 percent slopes. This soil is moderately steep, well drained, and deep. It is mainly on benches and hillsides. Slopes are often dissected by drainageways. Outcrops of limestone are in a few areas.

Typically, the surface layer is brown channery silt loam about 6 inches thick. The subsoil is yellowish red silty clay loam and channery silty clay about 25 inches thick. The substratum is reddish brown channery silty clay loam. It extends to calcareous shale or limestone at a depth of about 42 inches.

Included with this soil in mapping are several areas of Caneyville soils, several areas of soils that have less clay than the Edom soil, a few areas where slopes are less than 15 or more than 25 percent, a few areas of severely eroded soils, and a few areas of soils that have more rock fragments in the subsoil than the Edom soil. Also included are a few areas of stony soils and Rock outcrop. Included areas make up about 30 percent of this map unit.

The available water capacity of the Edom soil is moderate or high, and permeability is moderately slow or moderate. Runoff is rapid. Natural fertility is medium or high. This soil is strongly acid to neutral in the surface layer and the upper part of the subsoil and is moderately acid to mildly alkaline in the lower part of the subsoil and the substratum. The depth to bedrock is 40 to 60 inches.

Most areas of this soil are used for woodland. A few areas are used for hay or pasture.

This unit has limited suitability for cultivated crops. The hazard of erosion is severe in unprotected areas. Including hay in the long-term rotation, applying a system of conservation tillage, farming on the contour, growing cover crops and green manure crops, contour stripcropping, returning crop residue to the soil, and establishing grassed waterways for the safe removal of concentrated runoff can help to control erosion and maintain tilth.

This unit is suited to hay and pasture. Erosion is a severe hazard if the plant cover is removed by overgrazing. Because of a history of pond failures in areas of this unit, alternative water sources are needed for livestock. A planned grazing system that includes rotational grazing, proper stocking rates, brush management, and cutting of hay at the proper stages of maturity help to control erosion and maintain the desirable species of plants.

The potential productivity of this soil for trees is moderately high. The slope moderately limits the use of vehicular equipment. Plant competition is severe when openings are made in the canopy. Erosion on logging roads and skid trails also is a management concern. It can be controlled by building the roads and trails on the contour. Seedling mortality is a management concern on south aspects. Red oak, white oak, black walnut, and redcedar are the dominant species.

The slope is the main limitation on sites for dwellings. A moderate shrink-swell potential also is a limitation. Excavations for basements often encounter bedrock, but it generally can be ripped with conventional earth-moving equipment. When hard limestone is encountered, building above the bedrock and landscaping with additional fill material may be preferable to excavating the rock. The dwellings should be designed so that they conform to the natural slope of the land. The less sloping areas are the best sites for dwellings. Land shaping and grading can help to overcome the slope. Extra reinforcement can help footings and foundations to withstand the pressure exerted as the soils swell during wet periods. Also, adding porous backfill adjacent to basement walls helps to reduce this pressure. Establishing a plant cover and controlling runoff help to prevent excessive erosion on construction sites.

Low strength and the slope are the main limitations on sites for local roads and streets. Providing suitable subgrade or base material can help to prevent the road damage caused by low strength. Building the roads on the contour helps to overcome the slope.

The moderately slow permeability and the slope are limitations on sites for septic tank absorption fields. In some areas the underlying limestone is cavernous and can allow the effluent to pollute ground water. Installing large absorption fields on the contour helps to overcome the limited permeability and results in a more even distribution of effluent. The less sloping areas are the best sites for septic tank absorption fields. In a few areas the deeper included soils are available for use as sites for these fields.

The capability subclass is IVe.

EdE—Edom channery silt loam, 25 to 35 percent slopes. This soil is steep, well drained, and deep. It is mainly on benches and hillsides. Slopes often are dissected by drainageways. Outcrops of limestone are in a few areas.

Typically, the surface layer is brown channery silt loam about 6 inches thick. The subsoil is yellowish red silty clay loam and channery silty clay about 24 inches thick. The substratum is reddish brown channery silty clay loam. It extends to calcareous shale and limestone at a depth of about 42 inches.

Included with this soil in mapping are several areas of Caneyville and Opequon soils, several areas of soils that have less clay than the Edom soil, a few areas where slopes are less than 25 or more than 35 percent, a few areas of severely eroded soils, and a few areas of soils that have more rock fragments in the subsoil than the Edom soil. Also included are a few areas of stony soils and Rock outcrop. Included areas make up about 30 percent of this map unit.

The available water capacity of the Edom soil is moderate or high, and permeability is moderately slow or moderate. Runoff is very rapid. Natural fertility is medium or high. This soil is strongly acid to neutral in the surface layer and the upper part of the subsoil and is moderately acid to mildly alkaline in the lower part of the subsoil and the substratum. The depth to bedrock is 40 to 60 inches.

Most areas of this soil are used for woodland. Other areas are used for pasture.

This soil is not suited to cultivated crops or hay. The hazard of erosion is very severe in unprotected areas. The slope limits the safe use of conventional farm equipment.

This unit is suited to pasture. Erosion is a very severe hazard if the plant cover is removed by overgrazing. The slope prevents the safe operation of the conventional farm equipment used in clipping. Because of a history of pond failures in areas of this unit, alternative water sources are needed for livestock. A planned grazing system that includes rotational grazing, proper stocking rates, and brush management help to control erosion and maintain the desirable species of plants.

The potential productivity of this soil for trees is moderately high. The slope moderately limits the use of vehicular equipment. Plant competition is severe when openings are made in the canopy. Erosion on logging roads and skid trails also is a management concern. It can be controlled by building the roads and trails on the contour. Seedling mortality is a management concern on south aspects. Red oak, white oak, black walnut, and redcedar are the dominant species.

The slope, low strength, and the moderately slow permeability are the main limitations affecting most urban uses. A soil that is better suited to these uses should be considered.

The capability subclass is VIe.

EdF—Edom channery silt loam, 35 to 55 percent slopes. This soil is very steep, well drained, and deep. It is on hillsides. Slopes often are dissected by drainageways. Outcrops of limestone are in a few areas.

Typically, the surface layer is about 6 inches thick. The upper 3 inches is brown channery silt loam, and the lower 3 inches is strong brown channery silt loam. The subsoil is yellowish red silty clay loam and channery silty clay about 24 inches thick. The substratum is reddish brown channery silty clay loam. It extends to calcareous shale or limestone at a depth of about 41 inches.

Included with this soil in mapping are several areas of Caneyville and Opequon soils, several areas of soils that have less clay than the Edom soil, a few areas where slopes are less than 35 percent, a few areas of severely eroded soils, and a few areas of soils that have more rock fragments in the subsoil than the Edom soil. Also included are a few areas of stony soils and Rock outcrop. Included areas make up about 35 percent of this map unit.

The available water capacity of the Edom soil is moderate or high, and permeability is moderately slow or moderate. Runoff is very rapid. Natural fertility is medium or high. This soil is strongly acid to neutral in the surface layer and the upper part of the subsoil and is moderately acid to mildly alkaline in the lower part of the subsoil and the substratum. The depth to bedrock is 40 to 60 inches.

Most areas of this soil are used for woodland. A few areas are used for pasture.

This unit is not suited to cultivated crops or hay. The slope prevents the safe operation of conventional farm equipment.

This unit cannot be easily managed for pasture. The slope prevents the safe operation of the conventional equipment used in clipping and in applying fertilizer. The hazard of erosion is very severe if the plant cover is removed by overgrazing.

The potential productivity of this soil for trees is moderately high. The slope severely limits the use of vehicular equipment. Plant competition is severe when openings are made in the canopy. Erosion on logging roads and skid trails also is a management concern. It can be controlled by building the roads and trails on the contour. Seedling mortality is a limitation on south aspects. Red oak, white oak, black walnut, and redcedar are the dominant species.

The slope, low strength, and the moderately slow permeability are the main limitations on sites for dwellings, local roads and streets, and septic tank absorption fields. This unit generally is not used for urban development. A soil that is better suited should be considered.

The capability subclass is VIIe.

ElC—Elliber extremely channery loam, 8 to 15 percent slopes. This soil is very deep, strongly sloping, and well drained. It is on ridgetops and benches. This unit is in a wide band oriented in a north-south direction across the central part of the county. This soil has numerous rock fragments, which are mainly chert.

Typically, the surface layer is about 10 inches thick. The upper 6 inches is very dark gray extremely channery loam, and the lower 4 inches is light brownish gray extremely channery sandy loam. The subsoil is 55 inches or more thick. The upper 7 inches is brownish yellow extremely channery loam, and the lower 48 inches or more is light yellowish brown extremely channery loam.

Included with this soil in mapping are a few small areas of Blackthorn, Dekalb, and Opequon soils. Also included are small areas of stony soils and small areas where slopes are less than 8 or more than 15 percent. Included soils make up about 25 percent of this map unit.

The available water capacity of the Elliber soil is low or moderate, and permeability is moderately rapid or rapid. Runoff is rapid. Natural fertility is medium. This soil generally is extremely acid to strongly acid. Some areas have been limed. The surface layer in these areas is slightly acid or neutral. The depth to bedrock is more than 60 inches.

Most areas of this soil are used for pasture. Some areas are used for hay, and a few areas are wooded.

This soil is suited to cultivated crops, but numerous rock fragments make tillage difficult. Erosion is a severe hazard in unprotected areas. Including hay in the crop rotation, applying a system of conservation tillage, farming on the contour, growing cover crops and green manure crops, contour stripcropping, returning crop residue to the soil, and establishing grassed waterways for the safe removal of concentrated runoff help to control erosion and maintain tilth.

This soil is suited to hay and pasture. Erosion is a severe hazard if the plant cover is removed by overgrazing. Because the soil is poorly suited to construction of successful ponds and springs are rare, water for grazing animals is often scarce. A planned grazing system that includes rotational grazing, proper stocking rates, brush management, and cutting of hay at the proper stages of maturity help to control erosion and maintain the desirable species of plants.

The potential productivity of this soil for trees is moderately high. Few limitations affect woodland management, but plant competition is severe when openings are made in the canopy. Erosion on logging roads and skid trails also is a management concern. It can be controlled by building the roads and trails on the contour. Red oak, white oak, white pine, and black locust are the dominant species.

The slope and rock fragments are moderate limitations on sites for dwellings. The less sloping areas are the best sites for dwellings. The dwellings should be designed so that they conform to the natural slope of the land. Because the rock fragments interfere with the establishment of lawns and with landscaping, topsoil that has fewer rock fragments may be needed. Establishing a plant cover and controlling runoff help to prevent excessive erosion on construction sites.

The slope is a moderate limitation on sites for local roads and streets. Building the roads and streets on the contour helps to overcome this limitation. Locally this soil is considered as a good source of cherty base material for roads.

The slope and rock fragments are moderate limitations on sites for septic tank absorption fields. In some places the permeability is too rapid for adequate filtration of effluent. Installing large absorption fields on the contour helps to overcome this limitation.

The capability subclass is IVs.

ElD—Elliber extremely channery loam, 15 to 25 percent slopes. This very deep, moderately steep, and well drained soil is on ridgetops and benches. It is in a wide band that is oriented in a north-south direction across the central part of the county. The soil has numerous rock fragments, which are mainly chert.

Typically, the surface layer is about 9 inches thick. The upper 5 inches is very dark gray extremely channery loam, and the lower 4 inches is light brownish gray extremely channery sandy loam. The subsoil is 56 inches or more thick. The upper 7 inches is brownish yellow extremely channery loam, and the lower 49 inches or more is light yellowish brown extremely channery loam.

Included with this soil in mapping are a few small areas of Blackthorn, Dekalb, and Opequon soils. Also included are small areas of stony soils and small areas where slopes are less than 15 or more than 25 percent. Included soils make up about 25 percent of this map unit.

The available water capacity of the Elliber soil is low or moderate, and permeability is moderately rapid or rapid. Runoff is rapid. Natural fertility is medium. This soil generally is extremely acid to strongly acid. Some areas have been limed. The surface layer in these areas is slightly acid or neutral. The depth to bedrock is more than 60 inches.

Most areas of this soil are used for pasture. Some areas are used for hay, and a few areas are wooded.

This soil is not suited to cultivated crops. The rock fragments make tillage difficult. Erosion is a severe hazard in unprotected areas.

This soil is suited to hay and pasture. Erosion is a severe hazard if the plant cover is removed by overgrazing. Because the soil is poorly suited to construction of successful ponds and springs are rare, water for grazing animals is often scarce. A planned grazing system that includes rotational grazing, proper stocking rates, brush management, and cutting of hay at the proper stages of maturity help to control erosion and maintain the desirable species of plants.

The potential productivity of this soil for trees is moderately high. The slope moderately limits the use of vehicular equipment. Plant competition is moderate or severe when openings are made in the canopy. Erosion on logging roads and skid trails also is a management concern. It can be controlled by building the roads and trails on the contour. Seedling mortality is a management concern on south aspects. Red oak, white oak, white pine, and black locust are the dominant species.

The slope is a limitation on sites for dwellings. The rock fragments also are a limitation. The less sloping areas are the best sites for dwellings. Land shaping and grading can help to overcome the slope. The dwellings should be designed so that they conform to the natural slope of the land. Because the rock fragments interfere with the establishment of lawns and with landscaping, topsoil that has fewer rock fragments may be needed. Establishing a plant cover and controlling runoff help to prevent excessive erosion on construction sites.

The slope is a limitation on sites for local roads and streets. Building the roads and streets on the contour helps to overcome this limitation. Locally this soil is considered as a good source of cherty base material for roads.

The slope is the main limitation on sites for septic tank absorption fields. In some places the permeability is too rapid for adequate filtration of effluent. Installing large absorption fields on the contour helps to overcome this limitation. The less sloping included soils are the best sites for septic tank absorption fields.

The capability subclass is VIs.

ElE—Elliber extremely channery loam, 25 to 35 percent slopes. This very deep, steep, and well drained soil is on hillsides. It is in a wide band that is oriented in a north-south direction across the central part of the county. This soil has numerous rock fragments, which are mainly chert (fig. 4).

Typically, the surface layer is about 9 inches thick. The upper 4 inches is very dark gray extremely channery loam, and the lower 5 inches is light brownish gray extremely channery sandy loam. The subsoil is 56 inches or more thick. The upper 6 inches is brownish yellow extremely channery loam, and the lower 50 inches or more is light yellowish brown extremely channery loam.

Included with this soil in mapping are a few small areas of Blackthorn, Dekalb, and Opequon soils. Also included are small areas of stony soils and small areas where slopes are less than 25 or more than 35 percent. Included soils make up about 25 percent of this map unit.

The available water capacity of the Elliber soil is very low to moderate, and permeability is moderately rapid or rapid. Runoff is very rapid. Natural fertility is medium. This soil is extremely acid to strongly acid. The depth to bedrock is more than 60 inches.

Most areas of this soil are used for pasture. A few areas are wooded.

This soil is not suited to cultivated crops or hay. The slope limits the safe operation of conventional farm equipment. The rock fragments make tillage difficult. The hazard of erosion is very severe in unprotected areas.

This soil cannot be easily managed for pasture. Erosion is a very severe hazard if the plant cover is removed by overgrazing. Because the soil is poorly suited to construction of successful ponds and springs are rare, water for grazing animals is often scarce. The slope limits the safe operation of the conventional farm equipment used in clipping. A planned grazing system that includes rotational grazing, proper stocking rates, and brush management help to control erosion and maintain the desirable species of plants.

The potential productivity of this soil for trees is moderately high. The slope moderately limits the use of vehicular equipment. Plant competition is moderate or severe when openings are made in the canopy. Erosion

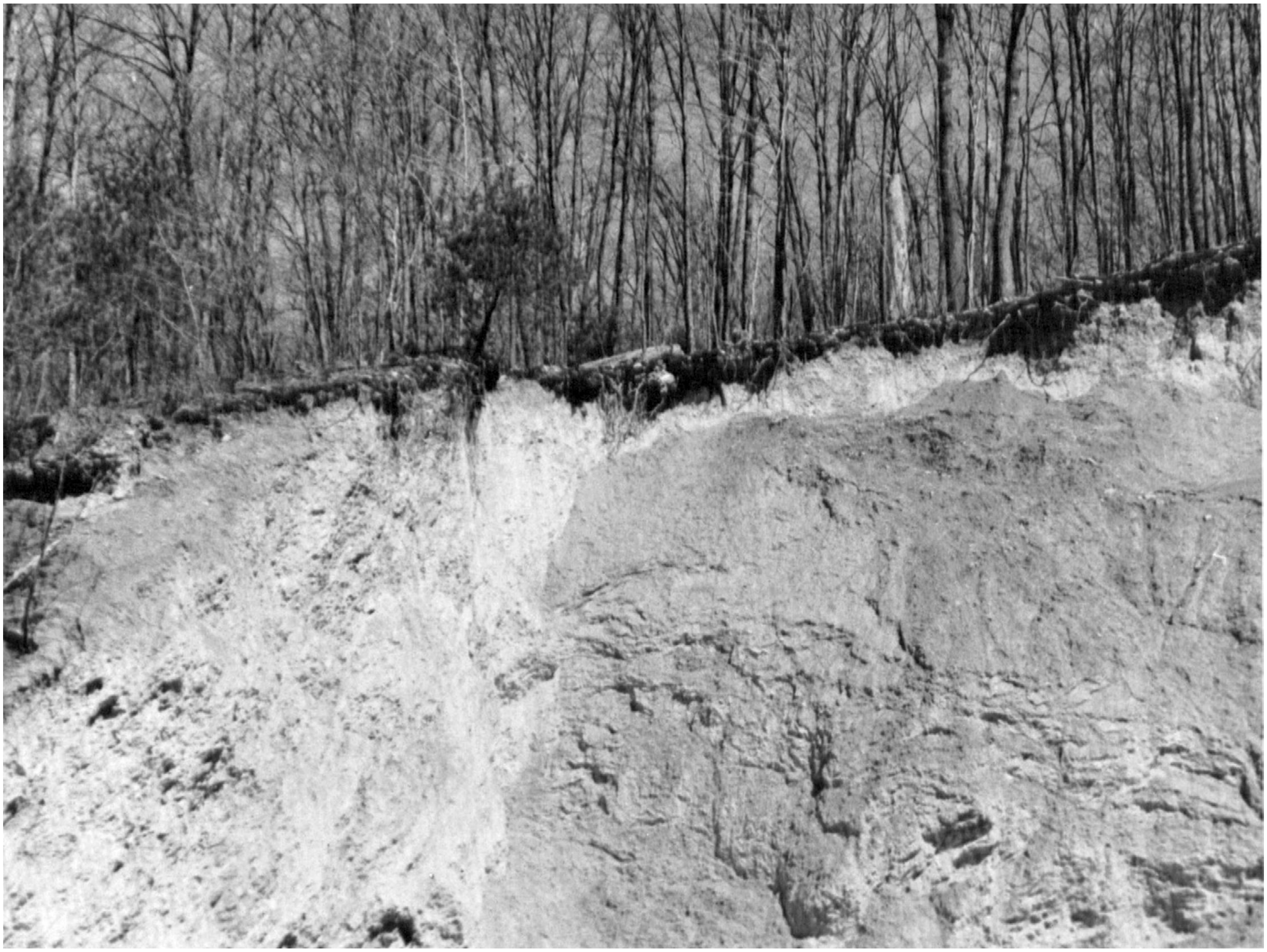

Figure 4.—Elliber extremely channery loam, 25 to 35 percent slopes, is a good source of base material for roads.

on logging roads and skid trails also is a management concern. It can be controlled by building the roads and trails on the contour. Seedling mortality is a management concern on south aspects. Red oak, white oak, white pine, and black locust are the dominant species.

The slope is the main limitation affecting most urban uses. A soil that is better suited to these uses should be considered. Locally this soil is considered as a good source of cherty base material for roads.

The capability subclass is VIIs.

ElF—Elliber extremely channery loam, 35 to 55 percent slopes. This very deep, very steep, and well drained soil is on hillsides. It is in a wide band that is oriented in a north-south direction across the central part of the county. The soil has numerous rock fragments, which are mainly chert.

Typically, the surface layer is about 8 inches thick. The upper 4 inches is very dark gray extremely channery loam, and the lower 4 inches is light brownish gray extremely channery sandy loam. The subsoil is 57 inches or more thick. The upper 7 inches is brownish yellow extremely channery loam, and the lower 50 inches or more is light yellowish brown extremely channery loam.

Included with this soil in mapping are a few small areas of Blackthorn, Dekalb, and Opequon soils. Also included are small areas of stony soils and small areas where slopes are less than 35 or more than 55 percent.

Included soils make up about 25 percent of this map unit.

The available water capacity of the Elliber soil is low or moderate, and permeability is moderately rapid or rapid. Runoff is very rapid. Natural fertility is medium. This soil is extremely acid to strongly acid. The depth to bedrock is more than 60 inches.

Most areas of this soil are used for pasture. A few areas are wooded.

This soil is not suited to cultivated crops or hay. The slope limits the safe operation of conventional farm equipment. The hazard of erosion is very severe in unprotected areas.

This soil cannot be easily managed for pasture. The slope prevents the safe operation of the conventional farm equipment used in clipping and in applying fertilizer. Erosion is a very severe hazard if the plant cover is removed by overgrazing. Because the soil is poorly suited to construction of successful ponds and springs are rare, water for grazing animals is often scarce.

The potential productivity of this soil for trees is moderately high. The slope severely limits the use of vehicular equipment. Plant competition is moderate or severe when openings are made in the canopy. Erosion on logging roads and skid trails also is a management concern. It can be controlled by building the roads and trails on the contour. Red oak, white oak, white pine, and black locust are the dominant species.

The slope is the main limitation on sites for dwellings, local roads and streets, and septic tank absorption fields. This unit is generally not used for urban development. A soil that is better suited should be considered.

The capability subclass is VIIs.

ErB—Ernest silt loam, 3 to 8 percent slopes. This soil is very deep, gently sloping, and moderately well drained. It is on foot slopes, in coves, along drainageways, and on benches. Seep spots are common during wet months in winter and spring.

Typically, the surface layer is dark yellowish brown silt loam about 8 inches thick. The subsoil is about 39 inches thick. The upper 18 inches is dark yellowish brown and brown silt loam mottled with light brownish gray in the lower part. The lower 21 inches is brown and yellowish brown, very firm and brittle silt loam mottled with grayish brown, light brownish gray, and reddish brown. The part of the substratum between depths of 47 and 65 inches is dark grayish brown silty clay loam mottled with reddish brown.

Included with this soil in mapping are a few areas of Berks and Monongahela soils, a few small areas of poorly drained soils, a few areas of stony soils, and several areas of soils that have a redder subsoil than the Ernest soil. Also included are a few areas where slopes are less than 3 or more than 8 percent, several areas of soils that do not have a fragipan or have one at a greater depth than the Ernest soil, and a few areas of deep, well drained soils. Included soils make up about 35 percent of this map unit.

The Ernest soil has a moderate available water capacity. It has a fragipan. Permeability is moderate above the fragipan and moderately slow or slow in it. Runoff is medium. Natural fertility is low. This soil generally is strongly acid or very strongly acid. Many areas have been limed. The surface layer in these areas is slightly acid or neutral. The seasonal high water table rises to about 1.5 feet from the surface during wet periods. The water table and the fragipan restrict the rooting depth of some plants. The depth to bedrock is more than 60 inches.

Most areas of this soil are used for hay and pasture. Some areas are used for cultivated crops or woodland.

This soil is suited to cultivated crops. Erosion is a moderate hazard in unprotected areas. The wetness often delays spring planting. Because of the restricted rooting depth, some plants are adversely affected by a shortage of water as the soil dries out in summer. Including hay in the crop rotation, applying a system of conservation tillage, farming on the contour, growing cover crops and green manure crops, and returning crop residue to the soil help to control erosion and maintain tilth.

This soil is suited to hay and pasture. It is better suited to grasses than legumes because of the seasonal high water table. Because the soil is soft when wet, grazing early in spring damages the sod. Erosion is a moderate hazard if the plant cover is removed by overgrazing. A planned grazing system that includes rotational grazing, proper stocking rates, deferment of spring grazing until the soil is firm, and cutting of hay at the proper stages of maturity help to control erosion and maintain the desirable species of plants.

The potential productivity of this soil for trees is moderately high. Plant competition is moderate when openings are made in the canopy. Erosion on logging roads and skid trails also is a management concern. It can be controlled by building the roads and trails on the contour. Because the soil is soft when wet, the use of equipment is restricted during wet periods. Red oak, white oak, sugar maple, and eastern white pine are the dominant species.

The seasonal high water table is the main limitation on sites for dwellings, especially for dwellings with basements. Installing footer drains and waterproofing walls help to keep basements dry. The well drained included soils are better sites for dwellings with basements. Establishing a plant cover and controlling runoff help to prevent excessive erosion on construction sites.

Low strength is a limitation on sites for local roads and streets. Because the soil is soft when wet, the pavement cracks under heavy loads. Constructing the roads on raised fill material and installing a drainage system help to overcome the low strength.

The seasonal high water table and the moderately slow or slow permeability are limitations on sites for septic tank absorption fields. In a few areas the better drained, more rapidly permeable included soils are available for use as sites for septic tank absorption fields. Installing deep drainage tile upslope from the absorption field can be effective in lowering the seasonal high water table. Installing large absorption fields on the contour helps to overcome the moderately slow or slow permeability.

The capability subclass is IIe.

ErC—Ernest silt loam, 8 to 15 percent slopes. This soil is very deep, strongly sloping, and moderately well drained. It is on foot slopes, in coves, along drainageways, and on benches. Seep spots are common during wet months in winter and spring.

Typically, the surface layer is dark yellowish brown silt loam about 7 inches thick. The subsoil is about 38 inches thick. The upper 17 inches is dark yellowish brown and brown silt loam mottled with light brownish gray in the lower part. The lower 21 inches is brown and yellowish brown, very firm and brittle silt loam mottled with grayish brown, light brownish gray, and reddish brown. The part of the substratum between depths of 45 and 65 inches is dark grayish brown silty clay loam mottled with reddish brown.

Included with this soil in mapping are a few areas of Berks and Monongahela soils, a few small areas of poorly drained soils, a few areas of stony soils, and several areas of soils that have a redder subsoil than the Ernest soil. Also included are a few areas where slopes are less than 8 or more than 15 percent, several areas of soils that do not have a fragipan or have one at a greater depth than the Ernest soil, and a few areas of deep, well drained soils. Included soils make up about 35 percent of this map unit.

The Ernest soil has a moderate available water capacity. It has a fragipan. Permeability is moderate above the fragipan and moderately slow or slow in it. Runoff is rapid. Natural fertility is low. This soil generally is strongly acid or very strongly acid. Many areas have been limed. The surface layer in these areas is slightly acid or neutral. This soil has a seasonal high water table that rises to about 1.5 feet from the surface during wet periods. The water table and the fragipan restrict the rooting depth of some plants. The depth to bedrock is more than 60 inches.

Most areas of this soil are used for hay and pasture. Some areas are used for cultivated crops or woodland.

This soil is suited to cultivated crops. Erosion is a severe hazard in unprotected areas. The wetness often delays spring planting. Because of the restricted rooting depth, some plants are adversely affected by a shortage of water as the soil dries out in summer. Including hay in the crop rotation, applying a system of conservation tillage, farming on the contour, growing cover crops and green manure crops, contour stripcropping, returning crop residue to the soil, and establishing grassed waterways for the safe removal of concentrated runoff help to control erosion and maintain tilth.

This soil is suited to hay and pasture. It is better suited to grasses than legumes because of the seasonal high water table. Because the soil is soft when wet, grazing early in spring damages the sod. Erosion is a severe hazard if the plant cover is removed by overgrazing. A planned grazing system that includes rotational grazing, proper stocking rates, deferment of spring grazing until the soil is firm, and cutting of hay at the proper stages of maturity help to control erosion and maintain the desirable species of plants.

The potential productivity of this soil for trees is moderately high. Plant competition is moderate when openings are made in the canopy. Erosion on logging roads and skid trails also is a management concern. It can be controlled by building the roads and trails on the contour. Because the soil is soft when wet, the use of equipment is restricted during wet periods. Red oak, white oak, sugar maple, and eastern white pine are the dominant species.

The seasonal high water table is the main limitation on sites for dwellings, especially for dwellings with basements. The slope also is a limitation. Installing footer drains and waterproofing walls help to keep basements dry. The well drained included soils are better sites for dwellings. The dwellings should be designed so that they conform to the natural slope of the land. The less sloping areas are the best sites for dwellings. Establishing a plant cover and controlling runoff help to prevent excessive erosion on construction sites.

Low strength is a limitation on sites for local roads and streets. Because this soil is soft when wet, the pavement cracks under heavy loads. The slope also is a limitation. Constructing the road on raised fill material and installing a drainage system help to overcome the limitations. Building the roads and streets on the contour helps to overcome the slope.

The seasonal high water table and the moderately slow or slow permeability are limitations on sites for septic tank absorption fields. In a few areas the better drained, more rapidly permeable included soils are available for use as sites for septic tank absorption fields. Installing deep drainage tile upslope from the absorption field can be effective in lowering the seasonal high water table. Installing large absorption fields on the contour helps to overcome the moderately slow or slow permeability.

The capability subclass is IIIe.

ErD—Ernest silt loam, 15 to 25 percent slopes. This soil is very deep, moderately steep, and moderately well drained. It is on foot slopes, in coves, along drainageways, and on benches. Seep spots are common during wet months in winter and spring.

Typically, the surface layer is dark yellowish brown silt loam about 5 inches thick. The subsoil is about 36 inches thick. The upper 16 inches is dark yellowish brown and brown silt loam mottled with light brownish gray in the lower part. The lower 20 inches is brown and yellowish brown, very firm and brittle silt loam mottled with grayish brown, light brownish gray, and reddish brown. The part of the substratum between depths of 41 and 65 inches is dark grayish brown silty clay loam mottled with reddish brown.

Included with this soil in mapping are a few areas of Berks soils, a few areas of stony soils, several areas of soils that have a redder subsoil than the Ernest soil, a few areas where slopes are less than 15 or more than 25 percent, and several areas of soils that do not have a fragipan or have one at a greater depth than the Ernest soil. Also included are a few areas of deep, well drained soils. Included soils make up about 25 percent of this map unit.

The Ernest soil has a moderate available water capacity. It has a fragipan. Permeability is moderate above the fragipan and moderately slow or slow in it. Runoff is rapid. Natural fertility is low. This soil generally is strongly acid or very strongly acid. Many areas have been limed. The surface layer in these areas is slightly acid or neutral. The seasonal high water table rises to about 1.5 feet from the surface during wet periods. The water table and the fragipan restrict the rooting depth of some plants. The depth to bedrock is more than 60 inches.

Most areas of this soil are used for pasture and hay. Some areas are used for woodland.

This soil has limited suitability for cultivated crops. Erosion is a severe hazard in unprotected areas. The wetness often delays spring planting. Because of the restricted rooting depth, some plants are adversely affected by a shortage of water as the soil dries out in summer. Including hay in the long-term crop rotation, applying a system of conservation tillage, farming on the contour, growing cover crops and green manure crops, contour stripcropping, returning crop residue to the soil, and establishing grassed waterways for the safe removal of concentrated runoff help to control erosion and maintain tilth.

This soil is suited to hay and pasture. It is better suited to grasses than legumes because of the seasonal high water table. Because the soil is soft when wet, grazing early in spring damages the sod. Erosion is a severe hazard if the plant cover is removed by overgrazing. A planned grazing system that includes rotational grazing, proper stocking rates, deferment of spring grazing until the soil is firm, brush management, and cutting of hay at the proper stages of maturity help to control erosion and maintain the desirable species of plants.

The potential productivity of this soil for trees is moderately high. Plant competition is moderate when openings are made in the canopy. Erosion on logging roads and skid trails also is a management concern. It can be controlled by building the roads and trails on the contour. Because the soil is soft when wet, the use of equipment is restricted during wet periods. Seedling mortality is a management concern on south aspects. Red oak, white oak, sugar maple, and eastern white pine are the dominant species.

The slope and the seasonal high water table are the main limitations on sites for dwellings, especially for dwellings with basements. Installing footer drains and waterproofing walls help to keep basements dry. The well drained included soils are better sites for dwellings. The dwellings should be designed so that they conform to the natural slope of the land. The less sloping areas are the best sites for dwellings. Land shaping and grading can help to overcome the slope. Establishing a plant cover and controlling runoff help to prevent excessive erosion on construction sites.

Low strength and the slope are limitations on sites for local roads and streets. Because this soil is soft when wet, the pavement cracks under heavy loads. Constructing the road on raised fill material and installing a drainage system help to overcome the limitations. Building the roads and streets on the contour helps to overcome the slope.

The slope, the seasonal high water table, and the moderately slow or slow permeability are limitations on sites for septic tank absorption fields. In a few areas the better drained, more rapidly permeable included soils are available for use as sites for septic tank absorption fields. Installing deep drainage tile upslope from the absorption field can be effective in lowering the seasonal high water table. The less sloping areas are the best sites for septic tank absorption fields. Installing large absorption fields on the contour helps to overcome the moderately slow or slow permeability.

The capability subclass is IVe.

GaC—Gauley channery loam, 3 to 15 percent slopes, rubbly. This soil is moderately deep, strongly sloping and gently sloping, and well drained. It is on ridgetops and benches along the top of Spruce Mountain and on Roaring Plains. This soil is in areas where the average annual precipitation is relatively high and temperatures are cool. Stones and boulders cover 50 to 90 percent of the surface. Slopes are generally smooth.

Typically, the surface layer is about 6 inches thick. The upper 3 inches is black channery loam, and the lower 3 inches is dark grayish brown very channery loam. The subsoil is about 24 inches thick. The upper 12 inches is dark reddish brown and reddish brown very channery loam, and the lower 12 inches is brown extremely channery loam. Sandstone is at a depth of about 30 inches.

Included with this soil in mapping are a few small areas of Mandy, Simoda, and Trussel soils, several areas where stones cover less than 50 percent of the surface, a few small areas that are more than 40 inches deep over bedrock, and a few areas of Rock outcrop. Also included are a few small areas where slopes are more than 15 percent. Included areas make up about 20 percent of this map unit.

The available water capacity of the Gauley soil is very low to moderate, and permeability is moderately rapid. Natural fertility is low. Runoff is rapid or medium. This soil is extremely acid to strongly acid. The roots of some plants are restricted by bedrock at a depth of 20 to 40 inches.

Most areas of this soil are wooded with brushy species. Several nonwooded areas, locally called sods, support mountain laurel, huckleberry, rhododendron, azalea, and native grasses. Most of this unit is in remote areas of the Monongahela National Forest. It is used mainly for recreation and botanical study.

This soil is not suited to cultivated crops, hay, or pasture. Stones and boulders prevent the operation of conventional farm equipment. Because of the altitude, the growing season is short. This limits the production of the commonly grown crops. A few areas of grasses are used for native summer pasture.

The potential productivity of this soil for red spruce is high. Stones and boulders limit the use of logging equipment. Seedling mortality is high, and plant competition is severe when openings are made in the canopy. The stones and boulders seriously interfere with the planting of seedlings. Red spruce, yellow birch, and red maple are the dominant species. The height of the trees often is limited by the strong westerly winds and the harsh climate. Limbs commonly are concentrated on the east-facing side of the trees, and the west-facing side is nearly bare. The undergrowth generally is brushy and dense and mostly impenetrable.

Stones and boulders are the main limitations on sites for dwellings, sanitary facilities, or local roads and streets. The depth to bedrock also is a limitation on sites for septic tank absorption fields or dwellings with basements. Because this soil is in remote areas, it generally is not used for building site development or sanitary facilities.

The capability subclass is VIIs.

GaE—Gauley channery loam, 15 to 35 percent slopes, rubbly. This soil is moderately deep, steep and moderately steep, and well drained. It is on ridgetops, benches, and hillsides along the top of Spruce Mountain and on Roaring Plains. This soil is in areas where the average annual precipitation is relatively high and temperatures are cool. Stones and boulders cover 50 to 90 percent of the surface. Slopes are generally smooth.

Typically, the surface layer is about 6 inches thick. The upper 3 inches is black channery loam, and the lower 3 inches is dark grayish brown very channery loam. The subsoil is about 23 inches thick. The upper 12 inches is dark reddish brown and reddish brown very channery loam, and the lower 11 inches is brown extremely channery loam. Sandstone is at a depth of about 29 inches.

Included with this soil in mapping are a few small areas of Mandy, Simoda, and Trussel soils, several areas where stones cover less than 50 percent of the surface, a few small areas that are more than 40 inches deep over bedrock, and a few areas of Rock outcrop. Also included are a few small areas where slopes are more than 35 percent. Included areas make up about 20 percent of this map unit.

The available water capacity of the Gauley soil is very low to moderate, and permeability is moderately rapid. Natural fertility is low. Runoff is very rapid or rapid. This soil is extremely acid to strongly acid. The roots of some plants are restricted by bedrock at a depth of 20 to 40 inches.

Most areas of this soil are wooded with brushy species. Several nonwooded areas, locally called sods, support mountain laurel, huckleberry, rhododendron, azalea, and native grasses. Most of this unit is in remote areas of the Monongahela National Forest. It is used mainly for recreation and botanical study.

This soil is not suited to cultivated crops, hay, or pasture. Stones and boulders prevent the operation of conventional farm equipment. Because of the altitude, the growing season is short. This limits the production of the commonly grown crops. A few areas of grasses are used for native summer pasture.

The potential productivity of this soil for red spruce is high. Stones and boulders limit the use of logging equipment. Seedling mortality is high, and plant competition is severe when openings are made in the canopy. The stones and boulders seriously interfere with the planting of seedlings after logging. Red spruce, yellow birch, and red maple are the dominant species. The height of the trees often is limited by the strong westerly winds and the harsh climate. Limbs commonly are concentrated on the east-facing side of the trees, and the west-facing side is nearly bare. The undergrowth generally is brushy and dense and mostly impenetrable.

The stones and boulders and the slope are the main limitations on sites for dwellings, sanitary facilities, or local roads and streets. The depth to bedrock also is a limitation on sites for septic tank absorption fields or dwellings with basements. Because this soil is in remote areas, it generally is not used for building site development or sanitary facilities.

The capability subclass is VIIs.

GaF—Gauley channery loam, 35 to 55 percent slopes, rubbly. This soil is moderately deep, very steep, and well drained. It is on hillsides along Spruce Mountain and Roaring Plains. This soil is in areas where the average annual precipitation is relatively high and temperatures are cool. Stones and boulders cover 50 to 90 percent of the surface. Outcrops of rock are common.

Typically, the surface layer is about 5 inches thick. The upper 2 inches is black channery loam, and the lower 3 inches is dark grayish brown very channery loam. The subsoil is about 23 inches thick. The upper 12 inches is dark reddish brown and reddish brown very channery loam, and the lower 11 inches is brown extremely channery loam. Sandstone is at a depth of about 28 inches.

Included with this soil in mapping are a few small areas of Mandy soils, several areas where stones cover less than 50 percent of the surface, a few areas of soils that are more than 40 inches deep over bedrock, and a few areas of Rock outcrop and Rubble land. Also included are a few small areas where slopes are less than 35 or more than 55 percent. Included areas make up about 20 percent of this map unit.

The available water capacity of the Gauley soil is very low to moderate, and permeability is moderately rapid. Natural fertility is low. Runoff is very rapid. This soil is extremely acid to strongly acid. The roots of some plants are restricted by bedrock at a depth of 20 to 40 inches.

This soil is almost entirely wooded. It is dominantly in remote areas of the Monongahela National Forest. Most areas are used for recreation and botanical study.

This soil is not suited to cultivated crops, hay, or pasture. The stones and boulders and the slope prevent the operation of conventional farm equipment. Because of the altitude, the growing season is short. This limits the production of the commonly grown crops. A few areas of grasses are used for native summer pasture.

The potential productivity of this soil for red spruce is high. The stones and boulders and the slope limit the use of logging equipment. Seedling mortality is high, and plant competition is severe when openings are made in the canopy. The stones and boulders seriously interfere with the planting of seedlings after logging. Red spruce, yellow birch, and red maple are the dominant species. The height of the trees on west aspects often is limited because of the strong winds and the harsh climate. Limbs are concentrated on the east-facing side of these trees, and the west-facing side is nearly bare. The undergrowth on west aspects generally is brushy and dense and mostly impenetrable. On the protected east aspects, the undergrowth is more open and trees are more symmetrical.

The stones and boulders and the slope are the main limitations on sites for dwellings, sanitary facilities, or local roads and streets. The depth to bedrock also is a limitation on sites for septic tank absorption fields or dwellings with basements. Because this soil is in remote areas, it generally is not used for building site development or sanitary facilities.

The capability subclass is VIIs.

GaG—Gauley channery loam, 55 to 80 percent slopes, rubbly. This soil is moderately deep, extremely steep, and well drained. It is on hillsides along Spruce Mountain and Roaring Plains. This soil is in areas where the average annual precipitation is relatively high and temperatures are cool. Stones and boulders cover 50 to 90 percent of the surface area. Outcrops of rock are common. This map unit was delineated only on maps of land managed by the United States Department of Agriculture, Forest Service, or adjacent private land. On most of the private land, this soil is included in unit GaF.

Typically, the surface layer is about 3 inches thick. The upper 1 inch is black channery loam, and the lower 2 inches is dark grayish brown very channery loam about 2 inches thick. The subsoil is about 23 inches thick. The upper 12 inches is dark reddish brown and reddish brown very channery loam, and the lower 11 inches is brown extremely channery loam. Sandstone is at a depth of about 26 inches.

Included with this soil in mapping are a few small areas of Mandy soils, several areas where stones cover less than 50 percent of the surface, a few areas of soils that are more than 40 inches deep over bedrock, and a few areas of Rock outcrop and Rubble land. Also included are a few small areas where slopes are less than 55 percent. Included areas make up about 25 percent of this map unit.

The available water capacity of the Gauley soil is very low to moderate, and permeability is moderately rapid. Natural fertility is low. Runoff is very rapid. This soil is extremely acid to strongly acid. The roots of some plants are restricted by bedrock at a depth of 20 to 40 inches.

This soil is almost entirely wooded. It is dominantly in remote areas of the Monongahela National Forest. Most areas are used for recreation and botanical study.

This soil is not suited to cultivated crops, hay, or pasture. The stones and boulders and the slope prevent the operation of conventional farm equipment. Because of the altitude, the growing season is short. This limits the production of the commonly grown crops.

The potential productivity of this soil for red spruce is high. The stones and boulders and the slope limit the use of logging equipment. Operating conventional harvesting equipment is unsafe on this extremely steep soil. Alternative methods of logging, such as cable logging, are needed. Construction of logging roads and skid trails is not recommended. Seedling mortality is high, and plant competition is severe when openings are made in the canopy. The stones and boulders seriously interfere with the planting of seedlings after logging. Red spruce, yellow birch, and red maple are the dominant species. The height of the trees on west aspects often is limited because of the strong winds and the harsh climate. Limbs are concentrated on the east-facing side of these trees, and the west-facing side is nearly bare. The undergrowth on west aspects generally is brushy and dense and mostly impenetrable. On the protected east aspects, the undergrowth is more open and trees are more symmetrical.

The stones and boulders and the slope are the main limitations on sites for dwellings, sanitary facilities, or local roads and streets. The depth to bedrock also is a limitation on sites for septic tank absorption fields or dwellings with basements. Because this soil is extremely steep and is in remote areas, it generally is not used for building site development or sanitary facilities.

The capability subclass is VIIs.

HdC—Hazleton-Dekalb complex, 3 to 15 percent slopes, stony. These gently sloping to strongly sloping, well drained, moderately deep to very deep soils are on ridgetops and benches. Stones cover 1 to 3 percent of the surface. Slopes are generally smooth. Outcrops of sandstone are common. This unit is about 40 percent Hazleton soil, 35 percent Dekalb soil, and 25 percent other soils and Rock outcrop. The Hazleton and Dekalb soils occur as areas so closely intermingled on the landscape that it was not practical to map them separately.

Typically, the surface layer of the Hazleton soil is about 6 inches thick. The upper 2 inches is dark grayish brown channery sandy loam, and the lower 4 inches is yellowish brown channery sandy loam. The subsoil is yellowish brown very channery sandy loam about 31 inches thick. The part of the substratum between depths of 37 and 65 inches is yellowish brown extremely channery loamy sand.

Typically, the surface layer of the Dekalb soil is about 6 inches thick. The upper 3 inches is very dark gray very channery sandy loam, and the lower 3 inches is grayish brown very channery sandy loam. The subsoil is yellowish brown channery sandy loam and very channery sandy loam. It extends to sandstone at a depth of about 26 inches.

Included with these soils in mapping are small areas of Elliber, Laidig, and Buchanan soils, some areas where stones cover more than 3 percent of the surface, and a few areas of nonstony soils. Also included are small areas where slopes are more than 15 percent, small areas of Rock outcrop, and some areas of shallower soils. Included areas make up about 25 percent of this map unit.

The available water capacity of the Dekalb soil is very low to moderate, and that of the Hazleton soil is low or moderate. Permeability is moderately rapid or rapid in both soils. Runoff is rapid or medium. Natural fertility is low. These soils generally are strongly acid to extremely acid. Some areas have been limed. The surface layer in these areas is moderately acid to neutral. The roots of some plants may be restricted by bedrock at a depth of 20 to 40 inches in the Dekalb soil. The depth to bedrock in areas of the Hazleton soil is at least 40 inches.

Most areas of this unit are used for woodland. A few small areas are used for pasture.

This unit is not suited to cultivated crops. The surface stoniness is the main limitation. Areas that are cleared of stones are suited to hay, but the stones beneath the surface would interfere with cultivation of crops.

This unit is suited to pasture, but droughtiness of the Dekalb soil limits forage production during midsummer. The stones interfere with clipping. Erosion is a moderate or severe hazard if the plant cover is removed by overgrazing. Water for livestock is scarce on this unit, but pond sites and potential spring development sites commonly are available along nearby drainageways. A planned grazing system that includes rotational grazing, proper stocking rates, and brush management help to control erosion and maintain the desirable species of plants.

Most areas are wooded. The potential productivity of this unit for trees is moderate or moderately high. The depth to bedrock, the low natural fertility, and the droughtiness of the Dekalb soil restrict tree growth. Plant competition is moderate when openings are made in the canopy. Seedling mortality also is a limitation on the Dekalb soil. The stones and other rock fragments in the surface layer interfere with the planting of seedlings. Erosion on logging roads and skid trails also is a management concern. It can be controlled by building the roads and trails on the contour. Chestnut oak, Virginia pine, red oak, black oak, and white oak are the dominant species on this unit.

The depth to bedrock in areas of the Dekalb soil is a limitation on sites for dwellings, especially for dwellings with basements. Slopes of more than 8 percent also are a limitation. The stones interfere with the establishment of lawns and with landscaping. The deeper soils are available for building site development. If the Dekalb soil is used as a site for dwellings, building above the bedrock and landscaping with additional fill material may be preferable to excavating the rock. The dwellings should be designed so that they conform to the natural slope of the land. The most gently sloping areas are the best sites for dwellings. Stones can be removed from lawn areas. Establishing a plant cover and controlling runoff help to prevent excessive erosion on construction sites.

The depth to bedrock and slopes of more than 8 percent are moderate limitations on sites for local roads and streets. Building the roads on the contour helps to overcome the slope. The more gently sloping, deeper areas are the best sites for local roads and streets. Because of the moderate depth to hard bedrock in the Dekalb soil, some blasting may be required if roads are constructed on this soil.

The depth to bedrock in areas of the Dekalb soil is a limitation on sites for septic tank absorption fields. Some areas of the Dekalb and Hazleton soils have large amounts of sand throughout the profile. The permeability in these areas may be too rapid for adequate filtration of effluent. Slopes of more than 8 percent also are a limitation. The deeper soils are available for use as sites for septic tank absorption fields. The less sloping areas are the best sites for these fields. Installing the absorption fields on the contour results in a more even distribution of effluent.

The capability subclass is VIs.

HdE—Hazleton-Dekalb complex, 15 to 35 percent slopes, stony. These moderately steep to steep, well drained, moderately deep to very deep soils are on ridgetops, benches, and hillsides. Stones cover 1 to 3 percent of the surface. Slopes commonly are dissected by drainageways. Outcrops of sandstone bedrock are common. This unit is about 40 percent Hazleton soil, 35 percent Dekalb soil, and 25 percent other soils and Rock outcrop. The Hazleton and Dekalb soils occur as areas so closely intermingled on the landscape that it was not practical to map them separately.

Typically, the surface layer of the Hazleton soil is about 5 inches thick. The upper 1 inch is dark grayish brown channery sandy loam, and the lower 4 inches is yellowish brown channery sandy loam. The subsoil is yellowish brown very channery sandy loam about 30 inches thick. The part of the substratum between depths of 35 and 65 inches is yellowish brown extremely channery loamy sand.

Typically, the surface layer of the Dekalb soil is about 3 inches thick. The upper 1 inch is very dark gray very channery sandy loam, and the lower 2 inches is grayish brown very channery sandy loam. The subsoil is yellowish brown channery sandy loam and very channery sandy loam. It extends to sandstone at a depth of about 27 inches.

Included with these soils in mapping are small areas of Elliber, Laidig, and Blackthorn soils, some areas where stones cover more than 3 percent of the surface, and a few areas of nonstony soils. Also included are small areas where slopes are less than 15 or more than 35 percent, areas of Rock outcrop, and areas of shallower soils. Included areas make up about 25 percent of this map unit.

The available water capacity of the Dekalb soil is very low to moderate, and that of the Hazleton soil is low or moderate. Permeability is moderately rapid or rapid in both soils. Runoff is rapid or very rapid. Natural fertility is low. These soils are strongly acid to extremely acid. The roots of some plants may be restricted by bedrock at a depth of 20 to 40 inches in the Dekalb soil. The depth to bedrock in areas of the Hazleton soil is at least 40 inches.

Most areas of this unit are used for woodland. A few areas are used for pasture.

This unit is not suited to cultivated crops. The slope is too steep for use of conventional farm equipment. The surface stoniness also is a limitation. The less sloping areas that are cleared of stones are suited to hay, but the stones beneath the surface would interfere with cultivation of crops.

This unit cannot be easily managed for pasture. The slope is the main limitation. The stones also are a limitation. Operating the conventional equipment used in clipping and in applying fertilizer is unsafe in the steeper areas. The droughtiness of the Dekalb soil limits forage production during midsummer. Erosion is a severe hazard if the plant cover is removed by overgrazing. Water for livestock is scarce on this unit, but pond sites and potential spring development sites commonly are available along nearby drainageways. A planned grazing system that includes rotational grazing, proper stocking rates, and brush management help to control erosion and maintain the desirable species of plants.

Most areas are wooded. The potential productivity of this unit for trees is moderate to moderately high. The depth to bedrock, the low natural fertility, and the droughtiness of the Dekalb soil restrict tree growth. The slope limits the use of equipment. Plant competition is a limitation when openings are made in the canopy. Seedling mortality also can be a limitation. The stones and other rock fragments in the surface layer interfere with the planting of seedlings. Erosion on logging roads and skid trails also is a management concern. It can be controlled by building the roads and trails on the contour. Chestnut oak, Virginia pine, red oak, black oak, and white oak are the dominant species.

The slope of both soils and the limited depth to bedrock in the Dekalb soil are limitations affecting most urban uses. A soil that is better suited to these uses should be considered.

The capability subclass is VIIs.

HdF—Hazleton-Dekalb complex, 35 to 55 percent slopes, stony. These very steep, well drained, moderately deep to very deep soils are on hillsides. Stones cover 1 to 3 percent of the surface. Slopes commonly are dissected by drainageways. Outcrops of sandstone are common. This unit is about 40 percent Hazleton soil, 35 percent Dekalb soil, and 25 percent other soils and Rock outcrop. The Hazleton and Dekalb soils occur as areas so closely intermingled on the landscape that it was not practical to map them separately.

Typically, the surface layer of the Hazleton soil is about 4 inches thick. The upper 1 inch is dark grayish brown channery sandy loam, and the lower 3 inches is yellowish brown channery sandy loam. The subsoil is yellowish brown very channery sandy loam about 29 inches thick. The part of the substratum between depths of 33 and 65 inches is yellowish brown extremely channery loamy sand.

Typically, the surface layer of the Dekalb soil is about 3 inches thick. The upper 1 inch is very dark gray very channery sandy loam, and the lower 2 inches is grayish brown very channery sandy loam. The subsoil is yellowish brown channery sandy loam and very channery sandy loam. It extends to sandstone at a depth of about 28 inches.

Included with these soils in mapping are small areas of Elliber, Laidig, and Blackthorn soils and some areas where stones cover more than 3 percent of the surface. Also included are small areas where slopes are less than 35 or more than 55 percent, areas of Rock outcrop, and areas of soils that are shallower over bedrock. Included areas make up about 25 percent of this map unit.

The available water capacity of the Dekalb soil is very low to moderate, and that of the Hazleton soil is low or moderate. Permeability is moderately rapid or rapid in both soils. Runoff is very rapid. Natural fertility is low. These soils are strongly acid to extremely acid. The roots of some plants may be restricted by bedrock at a depth of 20 to 40 inches in the Dekalb soil. The depth to bedrock in areas of the Hazleton soil is at least 40 inches.

Most areas of this unit are used for woodland. A few areas are used for pasture.

This unit is not suited to cultivated crops or hay. The slope prevents the safe operation of conventional farm equipment.

This unit cannot be easily managed for pasture. The slope prevents the safe operation of the conventional equipment used in clipping and in applying fertilizer. Erosion is a very severe hazard if the plant cover is removed by overgrazing.

The potential productivity of this unit for trees is moderate to moderately high. The depth to bedrock, the low natural fertility, and the droughtiness of the Dekalb soil restrict tree growth. The slope prevents the safe operation of logging equipment. Plant competition is a limitation when openings are made in the canopy. Seedling mortality also can be a limitation. The stones and other rock fragments in the surface layer interfere with the planting of seedlings. Erosion of logging roads and skid trails also is a management concern. It can be controlled by building the roads and trails on the contour. Chestnut oak, Virginia pine, red oak, black oak, and white oak are the dominant species on this unit.

The slope of both soils and the depth to bedrock in areas of the Dekalb soil are limitations for urban uses. A soil that is better suited to these uses should be considered.

The capability subclass is VIIs.

HdG—Hazleton-Dekalb complex, 55 to 80 percent slopes, stony. These extremely steep, well drained, moderately deep to very deep soils are on hillsides. This map unit was delineated only on maps of property managed by the United States Department of Agriculture, Forest Service, or adjacent privately owned land. On most of the private land, these soils are included in unit HdF. Stones cover 1 to 3 percent of the surface. Slopes commonly are dissected by drainageways. Outcrops of sandstone are common. This unit is about 40 percent Hazleton soil, 35 percent Dekalb soil, and 25 percent other soils and Rock outcrop. The Hazleton and Dekalb soils occur as areas so closely intermingled on the landscape that it was not practical to map them separately.

Typically, the surface layer of the Hazleton soil is about 3 inches thick. The upper 1 inch is dark grayish brown channery sandy loam, and the lower 2 inches is yellowish brown channery sandy loam. The subsoil is yellowish brown very channery sandy loam about 28 inches thick. The part of the substratum between depths of 31 and 65 inches is yellowish brown extremely channery loamy sand.

Typically, the surface layer of the Dekalb soil is about 3 inches thick. The upper 1 inch is very dark gray very channery sandy loam, and the lower 2 inches is grayish brown very channery sandy loam. The subsoil is yellowish brown channery sandy loam and very channery sandy loam. It extends to sandstone at a depth of about 27 inches.

Included with these soils in mapping are small areas of Elliber and Blackthorn soils and some areas where stones cover more than 3 percent of the surface. Also included are small areas where slopes are less than 55 percent, areas of Rock outcrop, and small areas of shallow soils. Included areas make up about 25 percent of this map unit.

The available water capacity of the Dekalb soil is very low to moderate, and that of the Hazleton soil is low or moderate. Permeability is moderately rapid or rapid in both soils. Runoff is very rapid. Natural fertility is low. These soils are strongly acid to extremely acid. The roots of some plants may be restricted by bedrock at a depth of 20 to 40 inches in the Dekalb soil. The depth to bedrock in areas of the Hazleton soil is at least 40 inches.

This unit is used for woodland.

This unit is not suited to cultivated crops, hay, or pasture. The slope prevents the use of conventional farm equipment. The hazard of erosion is very severe.

The potential productivity of this unit for trees is moderate to moderately high. The depth to bedrock, the lower natural fertility, and the droughtiness of the Dekalb soil restrict tree growth. The slope is a severe limitation. Operating conventional harvesting equipment is unsafe on this unit. Alternative methods of logging, such as cable logging, are needed. Construction of logging roads and skid trails is not recommended because of the hazard of erosion and the unsafe operating conditions. Plant competition is a limitation when openings are made in the canopy. Seedling mortality also may be a limitation. The stones and other rock fragments interfere with the planting of seedlings. Chestnut oak, Virginia pine, red oak, black oak, and white oak are the dominant species.

The slope prohibits the use of this soil for dwellings, sanitary facilities, and local roads and streets. The depth to bedrock in areas of the Dekalb soil also is a limitation.

The capability subclass is VIIs.

LaC—Laidig channery loam, 8 to 15 percent slopes. This soil is very deep, strongly sloping, and well drained. It is on foot slopes, in coves, along drainageways, and on benches.

Typically, the surface layer is about 6 inches thick. The upper 2 inches is dark grayish brown channery loam, and the lower 4 inches is light yellowish brown channery loam. The subsoil is about 59 inches thick. The upper 14 inches is light yellowish brown and brownish yellow channery loam. The next 14 inches is light yellowish brown channery sandy loam mottled with brownish yellow and light gray in the lower part. The lower 31 inches is brownish yellow, very firm or firm and brittle, channery sandy loam mottled with light gray and very pale brown.

Included with this soil in mapping are a few areas of Berks, Buchanan, and Dekalb soils, a few areas of stony soils, and a few areas where slopes are less than 8 or more than 15 percent. Also included are a few areas of soils that do not have a very firm and brittle subsoil or have a reddish brown subsoil. Included soils make up about 25 percent of this map unit.

The Laidig soil has a low or moderate available water capacity. It has a fragipan. Permeability is moderate or moderately rapid above the fragipan and moderately slow or slow in it. Runoff is rapid. Natural fertility is low. This soil generally is extremely acid to strongly acid. Some areas have been limed. The surface layer in these areas is slightly acid or neutral. The seasonal high water table rises to about 2.5 to 4.0 feet from the surface during wet periods. The water table and the fragipan restrict the rooting depth of some plants. The depth to bedrock is more than 60 inches.

Most areas of this soil are used for woodland. A few areas are used for cultivated crops or for hay and pasture.

This soil is suited to cultivated crops. Erosion is a severe hazard in unprotected areas. Including hay in the crop rotation, applying a system of conservation tillage, farming on the contour, growing cover crops and green manure crops, contour stripcropping, returning crop residue to the soil, and establishing grassed waterways for the safe removal of concentrated runoff help to control erosion and maintain tilth.

This soil is suited to hay and pasture. Erosion is a severe hazard if the plant cover is removed by overgrazing. A planned grazing system that includes rotational grazing, proper stocking rates, and cutting of hay at the proper stages of maturity help to control erosion and maintain the desirable species of plants.

Most acreage is wooded. The potential productivity of this soil for trees is moderately high. Plant competition is moderate when openings are made in the canopy. Erosion on logging roads and skid trails also is a management concern. It can be controlled by building the roads and trails on the contour. Red oak, white oak, black oak, and eastern white pine are the dominant species.

The slope is the main limitation on sites for dwellings. The seasonal high water table is a moderate limitation on sites for dwellings with basements. Installing footer drains and waterproofing walls help to keep basements dry. The better drained included soils are better sites for dwellings. The dwellings should be designed so that they conform to the natural slope of the land. The less sloping areas are the best sites for dwellings. Establishing a plant cover and controlling runoff help to prevent excessive erosion on construction sites.

Potential frost action and the slope are moderate limitations on sites for local roads and streets. Building the roads and streets on the contour helps to overcome the slope.

The seasonal high water table and the moderately slow to slow permeability in the lower part of the subsoil are limitations on sites for septic tank absorption fields. In a few areas the better drained, more rapidly permeable included soils are available for use as sites for septic tank absorption fields. Installing deep drainage tile upslope from the absorption field can be effective in lowering the seasonal high water table. Installing large absorption fields on the contour helps to overcome the moderately slow or slow permeability.

The capability subclass is IIIe.

LaD—Laidig channery loam, 15 to 25 percent slopes. This soil is very deep, moderately steep, and well drained. It is on foot slopes, in coves, along drainageways, and on benches.

Typically, the surface layer is about 6 inches thick. The upper 2 inches is dark grayish brown channery loam, and the lower 4 inches is light yellowish brown channery loam. The subsoil is about 59 inches thick. The upper 14 inches is light yellowish brown and brownish yellow channery loam. The next 14 inches is light yellowish brown channery sandy loam mottled with brownish yellow and light gray in the lower part. The lower 31 inches is brownish yellow, very firm or firm and brittle, channery sandy loam mottled with light gray and very pale brown.

Included with this soil in mapping are a few areas of Berks, Buchanan, and Dekalb soils, a few areas of stony soils, and a few areas where slopes are less than 15 or more than 25 percent. Also included are a few areas of soils that do not have a very firm or firm, brittle subsoil or have a reddish brown subsoil. Included soils make up about 25 percent of this map unit.

The Laidig soil has a low or moderate available water capacity. It has a fragipan. Permeability is moderate or moderately rapid above the fragipan and moderately slow or slow in it. Runoff is rapid. Natural fertility is low. This soil generally is extremely acid to strongly acid. Some areas have been limed. The surface layer in these areas is slightly acid or neutral. The seasonal high water table rises to about 2.5 to 4.0 feet from the surface during wet periods. The water table and the fragipan restrict the rooting depth of some plants. The depth to bedrock is more than 60 inches.

Most areas of this soil are used for woodland. A few areas are used for hay and pasture.

This soil has limited suitability for cultivated crops. Erosion is a severe hazard in unprotected areas. Including hay in the long-term crop rotation, applying a system of conservation tillage, farming on the contour, growing cover crops and green manure crops, contour stripcropping, returning crop residue to the soil, and establishing grassed waterways for the safe removal of concentrated runoff help to control erosion and maintain tilth.

This soil is suited to hay and pasture. Erosion is a severe hazard if the plant cover is removed by overgrazing. A planned grazing system that includes rotational grazing, proper stocking rates, and cutting of hay at the proper stages of maturity help to control erosion and maintain the desirable species of plants.

Most acreage is wooded. The potential productivity of this soil for trees is moderately high. Plant competition is moderate when openings are made in the canopy. Erosion on logging roads and skid trails also is a management concern. It can be controlled by building the roads and trails on the contour. The slope moderately limits the use of logging equipment. Seedling mortality is a management concern on south aspects. Red oak, white oak, black oak, and eastern white pine are the dominant species.

The slope is the main limitation on sites for dwellings. The seasonal high water table also is a limitation on sites for dwellings with basements. Installing footer drains and waterproofing walls help to keep basements dry. The better drained included soils are better suited as sites for dwellings. The dwellings should be designed so that they conform to the natural slope of the land. The less sloping areas are the best sites for dwellings. Land shaping and grading can help to overcome the slope. Establishing a plant cover and controlling runoff help to prevent excessive erosion on construction sites.

The slope is the main limitation on sites for local roads and streets. Building the roads and streets on the contour helps to overcome this limitation.

The slope, the seasonal high water table, and the moderately slow or slow permeability in the lower part of the subsoil are limitations on sites for septic tank absorption fields. In a few areas the gently sloping, better drained, more rapidly permeable included soils are available for use as sites for septic tank absorption fields. Installing deep drainage tile upslope from the absorption field can be effective in lowering the seasonal high water table. Installing large absorption fields on the contour helps to overcome the moderately slow or slow permeability.

The capability subclass is IVe.

LdE—Laidig channery loam, 15 to 35 percent slopes, stony. This soil is moderately steep to steep, well drained, and very deep. It is on foot slopes, in coves, along drainageways, and on benches. Stones cover 1 to 3 percent of the surface.

Typically, the surface layer is about 5 inches thick. The upper 1 inch is dark grayish brown channery loam, and the lower 4 inches is light yellowish brown channery loam. The subsoil is about 60 inches thick. The upper 14 inches is light yellowish brown and brownish yellow channery loam. The next 15 inches is light yellowish brown channery sandy loam mottled with brownish yellow and light gray in the lower part. The lower 31 inches is brownish yellow, very firm or firm and brittle, channery sandy loam mottled with light gray and very pale brown.

Included with this soil in mapping are a few areas of Berks, Buchanan, Dekalb, and Shouns soils and small areas where slopes are less than 15 or more than 35 percent. Also included are a few areas of very stony or rubbly soils and areas of soils that do not have a very firm or firm and brittle subsoil. Included areas make up about 35 percent of this map unit.

The Laidig soil has a low or moderate available water capacity. It has a fragipan. Permeability is moderate or moderately rapid above the fragipan and moderately slow or slow in it. Runoff is rapid or very rapid. Natural fertility is low. This soil is extremely acid to strongly acid. The seasonal high water table rises to about 2.5 to 4.0 feet from the surface during wet periods. The water table and the fragipan restrict the rooting depth of some plants. The depth to bedrock is more than 60 inches.

Most areas of this soil are used for woodland. Other areas are used for pasture.

This soil is not suited to cultivated crops. The surface stoniness and the slope are the main limitations. The less sloping areas that are cleared of stones are suited to hay, but the stones beneath the surface would interfere with cultivation of crops.

This soil cannot be easily managed for pasture. The slope is the main limitation. The stones also are a limitation. Operating the conventional equipment used in clipping and in applying fertilizer is unsafe in the steeper areas. Erosion is a severe hazard if the plant cover is removed by overgrazing. A planned grazing system that includes rotational grazing, proper stocking rates, and brush management help to control erosion and maintain the desirable species of plants.

Most areas are wooded. The potential productivity of this soil for trees is moderately high. The slope moderately limits the use of equipment. Erosion on logging roads and skid trails also is a management concern. It can be controlled by building the roads and trails on the contour. Plant competition is moderate when openings are made in the canopy. The stones and other rock fragments in the surface layer interfere with the planting of seedlings. Seedling mortality is a management concern on south aspects. Red oak, white oak, black oak, and eastern white pine are the dominant species.

The slope is the main limitation affecting most urban uses. The stones, the wetness, and the moderately slow or slow permeability also are limitations. A soil that is better suited to these uses should be considered.

The capability subclass is VIIs.

LeF—Laidig channery loam, 35 to 55 percent slopes, very stony. This soil is very steep, well drained, and very deep. It is on the lower slopes of hillsides. Stones cover 3 to 15 percent of the surface.

Typically, the surface layer is about 6 inches thick. The upper 2 inches is dark grayish brown channery loam, and the lower 4 inches is light yellowish brown channery loam. The subsoil is about 59 inches thick. The upper 16 inches is light yellowish brown and brownish yellow channery loam. The next 17 inches is light yellowish brown channery sandy loam mottled with brownish yellow and light gray in the lower part. The lower 26 inches is brownish yellow, very firm or firm and brittle, channery sandy loam mottled with light gray and very pale brown.

Included with this soil in mapping are a few small areas of Berks, Dekalb, and Shouns soils. Also included are areas where slopes are less than 35 percent, areas of soils that have more sand in the subsoil than the Laidig soil, areas of soils that do not have a fragipan, and a few areas of rubbly soils. Included areas make up about 35 percent of this map unit.

The Laidig soil has a low or moderate available water capacity. It has a fragipan. Permeability is moderate or moderately rapid above the fragipan and moderately slow or slow in it. Runoff is very rapid. Natural fertility is low. This soil is extremely acid to strongly acid. The seasonal high water table rises to about 2.5 to 4.0 feet from the surface during wet periods. The water table and the fragipan restrict the rooting depth of some plants. The depth to bedrock is more than 60 inches.

Most areas of this soil are used for woodland.

This soil is not suited to cultivated crops or hay. The slope prevents the safe operation of conventional farm equipment.

This soil cannot be easily managed for pasture. The slope prevents the safe operation of the conventional equipment used in clipping and in applying fertilizer. Stones also are a limitation. The hazard of erosion is very severe in areas where plant cover is removed by overgrazing.

Most areas are wooded. The potential productivity of this soil for trees is moderately high. The slope prevents the safe operation of equipment. Erosion on logging roads and skid trails also is a management concern. It can be controlled by building the roads and trails on the contour. Plant competition is moderate when openings are made in the canopy. The stones and other rock fragments in the surface layer interfere with the planting of seedlings. Seedling mortality is a management concern on south aspects. Red oak, white oak, black oak, and eastern white pine are the dominant species.

The slope is the main limitation affecting most urban uses. The stones, the wetness, and the moderately slow or slow permeability also are limitations. This unit generally is not used for urban development. A soil that is better suited should be considered.

The capability subclass is VIIs.

LgC—Laidig and Buchanan soils, 3 to 15 percent slopes, stony. These soils are gently sloping to strongly sloping, well drained and moderately well drained, and very deep. They are on foot slopes, in coves, along drainageways, and on benches. Stones cover 1 to 3 percent of the surface. Seep spots are common during wet months in winter and spring. The total acreage of this map unit is about 40 percent Laidig soil, 35 percent Buchanan soil, and 25 percent other soils. Some areas consist mostly of Laidig soil, some mostly of Buchanan soil, and some of both. These Laidig and Buchanan soils were mapped together because there are no major differences in the use and management of the soils.

Typically, the surface layer of the Laidig soil is about 6 inches thick. The upper 1 inch is dark grayish brown channery loam, and the lower 5 inches is light yellowish brown channery loam. The subsoil is about 59 inches thick. The upper 14 inches is light yellowish brown and brownish yellow channery loam. The next 14 inches is light yellowish brown channery sandy loam mottled with brownish yellow and light gray in the lower part. The lower 31 inches is brownish yellow, very firm or firm and brittle, channery sandy loam mottled with light gray and very pale brown.

Typically, the surface layer of the Buchanan soil is about 3 inches thick. The upper 1 inch is very dark grayish brown loam, and the lower 2 inches is light yellowish brown channery loam. The subsoil is about 47 inches thick. The upper 11 inches is light yellowish brown loam and sandy clay loam. The next 6 inches is yellowish brown channery sandy clay loam mottled with yellowish brown and light brownish gray. The lower 30 inches is very firm, light yellowish brown channery loam and very channery loam mottled with light gray, yellowish brown, strong brown, brownish yellow, and dark red. The part of the substratum between depths of 50 and 57 inches is pale brown channery loam mottled with yellowish brown, light gray, dark yellowish brown, and red. The part of the substratum between depths of 57 and 65 inches is light brownish gray channery loam mottled with yellowish brown and red.

Included with this unit in mapping are a few areas of Berks, Dekalb, and Shouns soils, a few areas where stones cover more than 3 percent of the surface, and a few areas where slopes are less than 3 or more than 15 percent. Also included are a few areas of soils that have more sand or clay in the subsoil than the Laidig and Buchanan soils and a few areas of soils that do not have a fragipan. Included areas make up about 25 percent of this map unit.

The available water capacity of the Laidig soil is low or moderate, and that of the Buchanan soil is moderate. Both soils have a fragipan. Permeability in the Laidig soil is moderate to moderately rapid above the fragipan and moderately slow or slow in it. Permeability in the Buchanan soil is moderate above the fragipan and slow in it. Runoff is medium or rapid on both soils. Natural fertility is low or medium in the Buchanan soil and low in the Laidig soil. Both soils generally are extremely acid to strongly acid. Some areas have been limed. The surface layer in these areas is slightly acid or neutral. The seasonal high water table in the Buchanan soil rises to about 1.5 feet from the surface during wet periods, and that in the Laidig soil rises to about 2.5 to 4.0 feet from the surface during wet periods. The water table and the fragipan in both soils restricts the rooting depth of some plants. The depth to bedrock is more than 60 inches in both soils.

Most areas of this unit are used for woodland. Other areas are used for pasture.

This unit is not suited to cultivated crops. The surface stoniness is the main limitation. Areas that are cleared of stones are suited to hay, but the stones beneath the surface would interfere with cultivation of crops.

This unit is suited to pasture. It is better suited to grasses than legumes because of the seasonal high water table. The stones interfere with clipping. Because the Buchanan soil is soft when wet, grazing early in spring damages the sod. Erosion is a severe or moderate hazard if the plant cover is removed by overgrazing. A planned grazing system that includes rotational grazing, proper stocking rates, deferment of spring grazing until the soil is firm, and brush management help to control erosion and maintain the desirable species of plants.

Most acreage is wooded. The potential productivity of this unit for trees is moderate to moderately high. Plant competition is moderate when openings are made in the canopy. Erosion on logging roads and skid trails also is a management concern. It can be controlled by building the roads and trails on the contour. Because the Buchanan soil is soft when wet, the use of equipment is restricted during wet periods. The stones and other rock fragments in the surface layer of both soils interfere with the planting of seedlings. Red oak, white oak, black oak, and eastern white pine are the dominant species.

The seasonal high water table is the main limitation on sites for dwellings, especially for dwellings with basements. Installing footer drains and waterproofing walls help to keep basements dry. The stones interfere with the establishment of lawns and with landscaping. The slope is a moderate limitation. The better drained included soils are better sites for dwellings. Stones can be removed from lawn areas. The dwellings should be designed so that they conform to the natural slope of the land. The less sloping areas are the best sites for dwellings. Land shaping and grading can help to overcome the slope. Establishing a plant cover and controlling runoff help to prevent excessive erosion on construction sites.

The slope and potential frost action are limitations on sites for local roads and streets. The wetness also is a limitation on the Buchanan soil. Because the Buchanan soil is soft when wet, the pavement cracks under heavy loads. Building the roads and streets on the contour helps to overcome the slope. Constructing roads and streets on raised fill material and installing drainage systems help to overcome the wetness and the potential frost action.

The seasonal high water table and the slow or moderately slow permeability in the subsoil are limitations on sites for septic tank absorption fields. The better drained, more rapidly permeable included soils are the best sites. Installing deep drainage tile upslope from the absorption field can be effective in lowering the seasonal high water table. Installing large absorption fields on the contour helps to overcome the limitation caused by slow or moderately slow permeability.

The capability subclass is VIs.

LhC—Lehew and Dekalb soils, 8 to 15 percent slopes. These strongly sloping, well drained, moderately deep soils are on ridgetops and benches. The total acreage of this map unit is about 45 percent Lehew soil, 35 percent Dekalb soil, and 20 percent other soils. Some areas consist mostly of Lehew soil, some mostly of Dekalb soil, and some of both. These Lehew and Dekalb soils were mapped together because there are no major differences in the use and management of the soils.

Typically, the surface layer of the Lehew soil is about 3 inches thick. The upper 1 inch is black channery fine sandy loam, and the lower 2 inches is reddish brown channery fine sandy loam. The subsoil is about 29 inches thick. The upper 14 inches is reddish brown channery fine sandy loam and very channery fine sandy loam, and the lower 15 inches is dark reddish brown channery fine sandy loam. The substratum is dark reddish brown very channery fine sandy loam. It extends to fractured, dark reddish brown sandstone at a depth of about 35 inches.

Typically, the surface layer of the Dekalb soil is about 6 inches thick. The upper 3 inches is very dark gray very channery sandy loam, and the lower 3 inches is grayish brown very channery sandy loam. The subsoil is yellowish brown channery sandy loam and very channery sandy loam. It extends to sandstone at a depth of 26 inches.

Included with these soils in mapping are a few areas of Calvin and Hazleton soils. Also included are a few small areas of stony soils and a few areas where slopes are less than 8 or more than 15 percent. Included soils make up about 20 percent of this map unit.

These soils have a very low to moderate available water capacity. They are droughty. Permeability is moderately rapid or rapid in both soils. Runoff is rapid. Natural fertility is low. The Lehew soil generally is strongly acid or very strongly acid, and the Dekalb soil generally is strongly acid to extremely acid. Some areas have been limed. The surface layer in these areas is slightly acid or neutral. The roots of some plants may be restricted by bedrock at a depth of 20 to 40 inches.

Most areas of this unit are used for woodland.

Several large areas have been cleared and are used for pasture and hay. A few areas are used for cultivated crops.

This unit is suited to cultivated crops. Because the soils are droughty, they are better suited to early maturing small grain than to late maturing crops, such as corn. Erosion is a severe hazard in unprotected areas. Including hay in the crop rotation, applying a system of conservation tillage, farming on the contour, growing cover crops and green manure crops, returning crop residue to the soil, and establishing grassed waterways for the safe removal of concentrated runoff can help to control erosion and maintain tilth. A system of conservation tillage that leaves plant residue on the surface also conserves moisture in these droughty soils.

These soils are suited to hay and pasture, but the droughtiness limits forage production during midsummer. Erosion is a severe hazard if the plant cover is removed by overgrazing. Water for livestock is scarce, but pond sites and potential spring development sites may be available along nearby drainageways. A planned grazing system that includes rotational grazing, proper stocking rates, brush management, and cutting of hay at the proper stages of maturity help to control erosion and maintain the desirable species of plants.

Most areas are wooded. The potential productivity of this unit for trees is moderate. Because the soils are droughty, seedling mortality is a management concern. Erosion on logging roads and skid trails also is a concern. It can be controlled by building the roads and trails on the contour. Plant competition is moderate when openings are made in the canopy. Chestnut oak, Virginia pine, red oak, black oak, and white oak are the dominant species.

The depth to bedrock is a limitation on sites for dwellings, especially for dwellings with basements. In many areas the bedrock is too hard to be excavated with conventional earth-moving equipment. The slope also is a limitation. The dwellings should be designed so that they conform to the natural slope of the land. The less sloping included areas commonly are available for building site development. Establishing a plant cover and controlling runoff help to prevent excessive erosion on construction sites.

The slope and the depth to bedrock are limitations on sites for local roads and streets. Building the roads and streets on the contour helps to overcome the slope. The bedrock commonly is encountered during road construction, and blasting may be required. Because these soils are droughty, maintaining vegetation on the roadbanks is difficult. Drought-tolerant species, such as tall fescue and crownvetch, should be selected for planting.

The depth to bedrock is the main limitation on sites for septic tank absorption fields. The slope also is a limitation. In a few areas the deeper included soils are available for use as sites for septic tank absorption fields. The less sloping areas are the best sites for these fields. Installing large absorption fields on the contour results in a more even distribution of effluent over a large area.

The capability subclass is IIIe.

LhD—Lehew and Dekalb soils, 15 to 25 percent slopes. These moderately steep, well drained, moderately deep soils are on ridgetops, benches, and hillsides. The total acreage of this map unit is about 45 percent Lehew soil, 35 percent Dekalb soil, and 20 percent other soils. Some areas consist mostly of Lehew soil, some mostly of Dekalb soil, and some of both. These Lehew and Dekalb soils were mapped together because there are no major differences in the use and management of the soils.

Typically, the surface layer of the Lehew soil is about 3 inches thick. The upper 1 inch is black channery fine sandy loam, and the lower 2 inches is reddish brown channery fine sandy loam. The subsoil is about 29 inches thick. The upper 14 inches is reddish brown channery fine sandy loam and very channery fine sandy loam, and the lower 15 inches is dark reddish brown channery fine sandy loam. The substratum is dark reddish brown very channery fine sandy loam. It extends to fractured, dark reddish brown sandstone at a depth of about 36 inches.

Typically, the surface layer of the Dekalb soil is about 4 inches thick. The upper 2 inches is very dark gray very channery sandy loam, and the lower 2 inches is grayish brown very channery sandy loam. The subsoil is yellowish brown channery sandy loam and very channery sandy loam. It extends to sandstone at a depth of about 27 inches.

Included with these soils in mapping are a few areas of Calvin and Hazleton soils. Also included are a few small areas of stony soils and a few areas where slopes are less than 15 or more than 25 percent. Included soils make up about 20 percent of this map unit.

These soils have a very low to moderate available water capacity. They are droughty. Permeability is moderately rapid or rapid in both soils. Runoff is rapid. Natural fertility is low. The Lehew soil generally is strongly acid or very strongly acid, and the Dekalb soil generally is strongly acid to extremely acid. Some areas have been limed. The surface layer in these areas is slightly acid or neutral. The roots of some plants may be restricted by bedrock at a depth of 20 to 40 inches.

Most areas of this unit are used for woodland. A few areas are used for pasture.

These soils have limited suitability for cultivated crops because of the droughtiness and the slope. The soils are better suited to early maturing small grain than to late maturing crops, such as corn. Erosion is a severe hazard in unprotected areas. Including hay in the long-term crop rotation, applying a system of conservation tillage, farming on the contour, growing cover crops and green manure crops, contour stripcropping, returning crop residue to the soil, and establishing grassed waterways for the safe removal of concentrated runoff can help to control erosion and maintain tilth. A system of conservation tillage that leaves plant residue on the surface also conserves moisture in these droughty soils.

This unit is suited to hay and pasture, but the droughtiness limits forage production during midsummer. Erosion is a severe hazard if the plant cover is removed by overgrazing. Water for livestock is scarce, but pond sites and potential spring development sites may be available along nearby drainageways. A planned grazing system that includes rotational grazing, proper stocking rates, brush management, and cutting of hay at the proper stages of maturity help to control erosion and maintain the desirable species of plants.

Most areas are wooded. The potential productivity of this unit for trees is moderate. The slope moderately limits the use of equipment. Because the soils are droughty, seedling mortality also is a limitation. Plant competition is a moderate limitation when openings are made in the canopy. Erosion on logging roads and skid trails also is a management concern. It can be controlled by building the roads and trails on the contour. Chestnut oak, Virginia pine, red oak, black oak, and white oak are the dominant species.

The slope is the main limitation on sites for dwellings. Also, the bedrock interferes with excavation for basements. In many areas it is too hard to be excavated with conventional earth-moving equipment. The dwellings should be designed so that they conform to the natural slope of the land. The less sloping areas are the best sites for dwellings. Land grading and shaping can help to overcome the slope. Establishing a plant cover and controlling runoff help to prevent excessive erosion on construction sites.

The slope is the main limitation on sites for local roads and streets. Building roads and streets on the contour helps to overcome this limitation. The bedrock commonly is encountered during road construction, and blasting may be required. Because these soils are droughty, maintaining vegetation on the roadbanks is difficult. Drought-tolerant species, such as tall fescue and crownvetch, should be selected for planting.

The depth to bedrock and the slope are limitations on sites for septic tank absorption fields. In a few areas the deeper included soils are available for use as sites for septic tank absorption fields. The less sloping areas are the best sites for these fields. Installing large absorption fields on the contour results in a more even distribution of effluent over a large area.

The capability subclass is IVe.

LkC—Lehew, Hazleton, and Dekalb soils, 3 to 15 percent slopes, stony. These soils are gently sloping to strongly sloping, well drained, and moderately deep to very deep. They are on ridgetops and benches along the upper slopes of North Fork Mountain. Stones cover 1 to 3 percent of the surface. Slopes are generally smooth. Outcrops of sandstone are common. The total acreage of this map unit is about 30 percent Lehew soil, 25 percent Hazleton soil, 20 percent Dekalb soil, and 25 percent other soils and Rock outcrop. Some areas consist mostly of Lehew soil, some mostly of Hazleton soil, some mostly of Dekalb soil, and some of all three soils. These Lehew, Hazleton, and Dekalb soils were mapped together because there are no major differences in the use and management of the soils.

Typically, the surface layer of the Lehew soil is about 3 inches thick. The upper 1 inch is black channery fine sandy loam, and the lower 2 inches is reddish brown channery fine sandy loam. The subsoil is about 29 inches thick. The upper 14 inches is reddish brown channery fine sandy loam and very channery fine sandy loam, and the lower 15 inches is dark reddish brown channery fine sandy loam. The substratum is dark reddish brown very channery fine sandy loam. It extends to fractured, dark reddish brown sandstone at a depth of about 35 inches.

Typically, the surface layer of the Hazleton soil is about 6 inches thick. The upper 2 inches is dark grayish brown channery sandy loam, and the lower 4 inches is yellowish brown channery sandy loam. The subsoil is yellowish brown very channery sandy loam about 31 inches thick. The part of the substratum between depths of 37 and 65 inches is yellowish brown extremely channery loamy sand.

Typically, the surface layer of the Dekalb soil is about 6 inches thick. The upper 3 inches is very dark gray very channery sandy loam, and the lower 3 inches is grayish brown very channery sandy loam. The subsoil is yellowish brown channery sandy loam and very channery sandy loam. It extends to sandstone at a depth of about 26 inches.

Included with these soils in mapping are a few small areas of Calvin, Laidig, and Buchanan soils. Also included are a few areas of shallow, very stony, or nonstony soils, areas of Rock outcrop, and areas where slopes are less than 3 or more than 15 percent. Included soils and Rock outcrop make up about 25 percent of this map unit.

The available water capacity of the Lehew and Dekalb soils is very low to moderate, and that of the Hazleton soil is low or moderate. Permeability is moderately rapid or rapid in all three soils. Runoff is rapid or medium. Natural fertility is low. The Lehew soil is strongly acid or very strongly acid, and the Hazleton and Dekalb soils are strongly acid to extremely acid. The roots of some plants may be restricted by bedrock at a depth of 20 to 40 inches in the Lehew and Dekalb soils. The depth to bedrock in areas of the Hazleton soil is at least 40 inches.

Most areas of this unit are used for woodland. A few small areas are used for pasture.

This unit is not suited to cultivated crops. The surface stoniness is the main limitation. Areas that are cleared of stones are suited to hay, but the stones beneath the surface would interfere with cultivation of crops.

This unit is suited to pasture, but the droughtiness of the Lehew and Dekalb soils limits forage production during midsummer. The stones interfere with clipping. Erosion is a moderate or severe hazard if the plant cover is removed by overgrazing. Water for livestock is scarce on this unit, but pond sites and potential spring development sites may be available along nearby drainageways. A planned grazing system that includes rotational grazing, proper stocking rates, and brush management help to control erosion and maintain the desirable species of plants.

Most areas are wooded. The potential productivity of this unit for trees is moderate or moderately high. Few limitations affect woodland management, but plant competition is moderate when openings are made in the canopy. Because the Lehew and Dekalb soils are droughty, seedling mortality also is a limitation. The stones and other rock fragments in the surface layer interfere with the planting of seedlings. Erosion on logging roads and skid trails also is a management concern. It can be controlled by building the roads and skid trails on the contour. Chestnut oak, Virginia pine, red oak, black oak, and white oak are the dominant species.

The depth to bedrock in areas of the Lehew and Dekalb soils is a limitation on sites for dwellings, especially for dwellings with basements. Slopes of more than 8 percent also are a limitation. The stones interfere with the establishment of lawns and with landscaping. The deeper soils are available for building site development. Building above the bedrock and landscaping with additional fill material may be preferable to excavating the rock. The dwellings should be designed so that they conform to the natural slope of the land. The less sloping areas are the best sites for dwellings. Stones can be removed from lawn areas. Establishing a plant cover and controlling runoff help to prevent excessive erosion on construction sites.

The depth to bedrock and slopes of more than 8 percent are moderate limitations on sites for local roads and streets. Building the roads on the contour and selecting the less sloping areas help to overcome the slope. The deeper soils are the best sites. The bedrock commonly is encountered during road construction, especially in areas of the Lehew and Dekalb soils, and blasting may be required.

The depth to bedrock in areas of the Lehew and Dekalb soils is a limitation on sites for septic tank absorption fields. Also, small areas of these soils contain large amounts of sand. The permeability in these areas is too rapid for adequate filtration of effluent. Slopes of more than 8 percent also are a limitation. The deeper soils are available for use as sites for septic tank absorption fields. The less sloping areas are the best sites for these fields. Installing the absorption fields on the contour results in a more even distribution of effluent.

The capability subclass is VIs.

LkE—Lehew, Hazleton, and Dekalb soils, 15 to 35 percent slopes, stony. These soils are steep or moderately steep, well drained, and moderately deep to very deep. They are on ridgetops, benches, and hillsides along the upper slopes of North Fork Mountain. Stones cover 1 to 3 percent of the surface. Slopes commonly are dissected by drainageways. Outcrops of sandstone are common. The total acreage of this map unit is about 30 percent Lehew soil, 25 percent Hazleton soil, 20 percent Dekalb soil, and 25 percent other soils and Rock outcrop. Some areas consist mostly of Lehew soil, some mostly of Hazleton soil, some mostly of Dekalb soil, and some of all three soils. These soils were mapped together because there are no major differences in the use and management of the soils.

Typically, the surface layer of the Lehew soil is about 3 inches thick. The upper 1 inch is black channery fine sandy loam, and the lower 2 inches is reddish brown channery fine sandy loam. The subsoil is about 27 inches thick. The upper 14 inches is reddish brown channery fine sandy loam and very channery fine sandy loam, and the lower 13 inches is dark reddish brown channery fine sandy loam. The substratum is dark reddish brown very channery fine sandy loam. It extends to fractured, dark reddish brown sandstone at a depth of about 36 inches.

Typically, the surface layer of the Hazleton soil is about 5 inches thick. The upper 1 inch is dark grayish brown channery sandy loam, and the lower 4 inches is yellowish brown channery sandy loam. The subsoil is yellowish brown very channery sandy loam about 30 inches thick. The part of the substratum between depths of 35 and 65 inches is yellowish brown extremely channery loamy sand.

Typically, the surface layer of the Dekalb soil is about 3 inches thick. The upper 1 inch is very dark gray very channery sandy loam, and the lower 2 inches is grayish brown very channery sandy loam. The subsoil is yellowish brown channery sandy loam and very channery sandy loam. It extends to sandstone at a depth of about 27 inches.

Included with these soils in mapping are a few small areas of Berks, Calvin, Laidig, and Blackthorn soils. Also included are a few areas of shallow or very stony soils, areas of Rock outcrop, and areas where slopes are less than 15 or more than 35 percent. Included soils and Rock outcrop make up about 25 percent of this map unit.

The available water capacity of the Lehew and Dekalb soils is very low to moderate, and that of the Hazleton soil is low or moderate. Permeability is moderately rapid or rapid in all three soils. Runoff is rapid or very rapid. Natural fertility is low. The Lehew soil is strongly acid or very strongly acid, and the Hazleton and Dekalb soils are strongly acid to extremely acid. The roots of some plants may be restricted by bedrock at a depth of 20 to 40 inches in the Lehew and Dekalb soils. The depth to bedrock in areas of the Hazleton soil is at least 40 inches.

Most areas of this unit are used for woodland. A few areas are used for pasture.

This unit is not suited to cultivated crops. The slope is too steep for the operation of conventional farm equipment. The surface stoniness also is a limitation. The less sloping areas that are cleared of stones are suited to hay, but the stones beneath the surface would interfere with cultivation of crops.

This unit cannot be easily managed for pasture. The slope is the main limitation. The stones also are a limitation. Operating the conventional equipment used in clipping and in applying fertilizer is unsafe in the steeper areas. The droughtiness of the Lehew and Dekalb soils limits forage production during midsummer. Erosion is a severe hazard if the plant cover is removed by overgrazing. Water for livestock is scarce on this unit, but pond sites and potential spring development sites may be available along nearby drainageways. A planned grazing system that includes rotational grazing, proper stocking rates, and brush management help to control erosion and maintain the desirable species of plants.

Most areas are wooded. The potential productivity of this unit for trees is moderate or moderately high. The slope limits the use of equipment. Plant competition is a moderate limitation when openings are made in the canopy. Seedling mortality also is a limitation, especially in areas of the droughty Lehew and Dekalb soils. The stones and other rock fragments in the surface layer interfere with the planting of seedlings. Erosion on logging roads and skid trails also is a management concern. It can be controlled by building the roads and trails on the contour. Chestnut oak, Virginia pine, red oak, black oak, and white oak are the dominant species.

The slope is the main limitation affecting most urban uses. The depth to bedrock in areas of the Lehew and Dekalb soils also is a limitation. A soil that is better suited to these uses should be considered.

The capability subclass is VIIs.

LkF—Lehew, Hazleton, and Dekalb soils, 35 to 55 percent slopes, stony. These soils are very steep, well drained, and moderately deep to very deep. They are on hillsides along the upper slopes of North Fork Mountain. Stones cover 1 to 3 percent of the surface. Slopes commonly are dissected by drainageways. Outcrops of sandstone are common. The total acreage of this map unit is about 30 percent Lehew soil, 25 percent Hazleton soil, 20 percent Dekalb soil, and 25 percent other soils and Rock outcrop. Some areas consist mostly of Lehew soil, some mostly of Hazleton soil, some mostly of Dekalb soil, and some of all three soils. These soils were mapped together because there are no major differences in the use and management of the soils.

Typically, the surface layer of the Lehew soil is about 3 inches thick. The upper 1 inch is black channery fine sandy loam, and the lower 2 inches is reddish brown channery fine sandy loam. The subsoil is about 28 inches thick. The upper 14 inches is reddish brown channery fine sandy loam and very channery fine sandy loam, and the lower 14 inches is dark reddish brown channery fine sandy loam. The substratum is dark reddish brown very channery fine sandy loam. It extends to fractured, dark reddish brown sandstone at a depth of about 35 inches.

Typically, the surface layer of the Hazleton soil is about 4 inches thick. The upper 1 inch is dark grayish brown channery sandy loam, and the lower 3 inches is yellowish brown channery sandy loam. The subsoil is yellowish brown very channery sandy loam about 29 inches thick. The part of the substratum between depths of 33 and 65 inches is yellowish brown extremely channery loamy sand.

Typically, the surface layer of the Dekalb soil is about 3 inches thick. The upper 1 inch is very dark gray very channery sandy loam, and the lower 2 inches is grayish brown very channery sandy loam. The subsoil is yellowish brown channery sandy loam and very channery sandy loam. It extends to sandstone at a depth of about 28 inches.

Included with these soils in mapping are a few small areas of Berks, Calvin, Laidig, and Blackthorn soils. Also included are a few areas of shallow or very stony soils, areas of Rock outcrop, and areas where slopes are less than 35 or more than 55 percent. Included soils and Rock outcrop make up about 25 percent of this map unit.

The available water capacity of the Lehew and Dekalb soils is very low to moderate, and that of the Hazleton soil is low or moderate. Permeability is moderately rapid or rapid in all three soils. Runoff is very rapid. Natural fertility is low. The Lehew soil is strongly acid or very strongly acid, and the Hazleton and Dekalb soils are strongly acid to extremely acid. The roots of some plants may be restricted by bedrock at a depth of 20 to 40 inches in the Lehew and Dekalb soils. The depth to bedrock in areas of the Hazleton soil is at least 40 inches.

This unit is used for woodland.

This unit is not suited to cultivated crops or hay. The slope prevents the safe operation of conventional farm equipment.

This unit cannot be easily managed for pasture. The slope prevents the safe operation of the conventional equipment used in clipping and in applying fertilizer. Erosion is a very severe hazard if the plant cover is removed by overgrazing.

The potential productivity of this unit for trees is moderate or moderately high. The slope prevents the safe operation of logging equipment. Plant competition is a moderate limitation when openings are made in the canopy. Seedling mortality also is a limitation, especially on the droughty Lehew and Dekalb soils. The stones and other rock fragments in the surface layer interfere with the planting of seedlings. Erosion on logging roads and skid trails also is a management concern. It can be controlled by building the roads and trails on the contour. Chestnut oak, Virginia pine, red oak, black oak, and white oak are the dominant species.

The slope and the depth to bedrock are the main limitations affecting most urban uses. This unit generally is not used for urban development. A soil that is better suited should be considered.

The capability subclass is VIIs.

LkG—Lehew, Hazleton, and Dekalb soils, 55 to 80 percent slopes, stony. These soils are extremely steep, well drained, and moderately deep to very deep. They are on hillsides along the upper slopes of North Fork Mountain. This map unit was delineated only on property managed by the United States Department of Agriculture, Forest Service, or adjacent private land. On most of the private land, these soils are included in unit LkF. Stones cover 1 to 3 percent of the surface. Slopes commonly are dissected by drainageways. Outcrops of sandstone are common. The total acreage of this unit is about 30 percent Lehew soil, 25 percent Hazleton soil, 20 percent Dekalb soil, and 25 percent other soils and Rock outcrop. Some areas consist mostly of Lehew soil, some mostly of Hazleton soil, some mostly of Dekalb soil, and some of all three soils. These soils were mapped together because there are no major differences in the use and management of the soils.

Typically, the surface layer of the Lehew soil is about 3 inches thick. The upper 1 inch is black channery fine sandy loam, and the lower 2 inches is reddish brown channery fine sandy loam. The subsoil is about 28 inches thick. The upper 13 inches is reddish brown channery fine sandy loam and very channery fine sandy loam, and the lower 15 inches is dark reddish brown channery fine sandy loam. The substratum is dark reddish brown very channery fine sandy loam. It extends to fractured, dark reddish brown sandstone at a depth of about 34 inches.

Typically, the surface layer of the Hazleton soil is about 3 inches thick. The upper 1 inch is dark grayish brown channery sandy loam, and the lower 2 inches is yellowish brown channery sandy loam. The subsoil is yellowish brown very channery sandy loam about 28 inches thick. The part of the substratum between depths of 31 and 65 inches is yellowish brown extremely channery loamy sand.

Typically, the surface layer of the Dekalb soil is about 3 inches thick. The upper 1 inch is very dark gray very channery sandy loam, and the lower 2 inches is grayish brown very channery sandy loam. The subsoil is yellowish brown channery sandy loam and very channery sandy loam. It extends to sandstone at a depth of about 27 inches.

Included with these soils in mapping are a few small areas of Berks and Calvin soils. Also included are a few areas of shallow or very stony soils, areas of Rock outcrop, and areas where slopes are less than 55 percent. Included soils and Rock outcrop make up about 25 percent of this map unit.

The available water capacity of the Lehew and Dekalb soils is very low to moderate, and that of the Hazleton soil is low or moderate. Permeability is moderately rapid or rapid in all three soils. Runoff is very rapid. Natural fertility is low. The Lehew soil is strongly acid or very strongly acid, and the Hazleton and Dekalb soils are strongly acid to extremely acid. The roots of some plants may be restricted by bedrock at a depth of 20 to 40 inches in the Lehew and Dekalb soils. The depth to bedrock in areas of the Hazleton soil is at least 40 inches.

This unit is used for woodland.

This unit is not suited to cultivated crops, hay, or pasture. The slope prevents the use of conventional farm equipment. The hazard of erosion is very severe.

The potential productivity of this unit for trees is moderate or moderately high. The slope is the main limitation. Operating conventional logging equipment is unsafe on this unit. Alternative methods of logging, such cable logging, are needed. Construction of logging roads and skid trails is not recommended because of the hazard of erosion and the unsafe operating conditions. Plant competition is a moderate limitation when openings are made in the canopy. Seedling mortality also is a limitation, especially on the droughty Lehew and Dekalb soils. The stones and other rock fragments interfere with the planting of seedlings. Chestnut oak, Virginia pine, red oak, black oak, and white oak are the dominant species.

The slope prohibits the use of this soil for dwellings, sanitary facilities, and local roads and streets. The depth to bedrock in areas of the Lehew and Dekalb soils also is a limitation.

The capability subclass is VIIs.

LmF—Lithic Udorthents-Rock outcrop complex, 35 to 80 percent slopes. These very steep and extremely steep, very shallow, excessively drained soils and outcrops of mainly shale and siltstone are on severely eroded hillsides, mostly on southern and western exposures. This unit is about 50 percent Lithic Udorthents, 45 percent Rock outcrop, and 5 percent other soils. The Lithic Udorthents and Rock outcrop are so intermingled on the landscape that it was not practical to map them separately.

Typically, the Lithic Udorthents are yellowish brown very channery and extremely channery silt loam less than 10 inches thick over bedrock. The Rock outcrop consists mostly of areas of exposed shale and siltstone, but some areas are thinly bedded sandstone.

Included with this unit in mapping are a few small areas of Berks and Weikert soils. Included areas make up about 5 percent of this map unit.

The Lithic Udorthents have a very low available water capacity. These soils are droughty. Permeability is rapid or very rapid. Runoff is very rapid. Natural fertility is low. The soils are strongly acid or very strongly acid. The roots of some plants may be restricted by bedrock within a depth of 10 inches.

This unit is sparsely wooded with pine and scrubby hardwoods. It is not suited to cultivated crops, hay, or pasture. The slope prevents the safe use of conventional farm equipment. The droughtiness and the slope prevent production of the commonly grown crops. The hazard of further erosion is very severe.

The potential productivity of this unit for trees is low. Essentially no commercial timber grows on this unit. The slope and the depth to bedrock are the main limitations. The areas of Rock outcrop and the rock fragments interfere with the planting of seedlings. Because of the droughtiness, the rate of seedling survival is low. Trees are likely to be uprooted during periods of high winds or heavy snowfall because the roots are restricted by the depth to bedrock. Virginia pine, scrub oak, and chestnut oak are the dominant species.

The slope prohibits the use of this unit for building site development, sanitary facilities, and local roads and streets. The depth to bedrock also is a limitation.

The capability subclass is VIIe.

Lo—Lobdell loam. This soil is very deep, nearly level, and moderately well drained. It is on flood plains along the major streams in the eastern three-fourths of the county. It is occasionally flooded. The slope ranges from 0 to 3 percent.

Typically, the surface layer is dark brown loam about 15 inches thick. The subsoil is about 18 inches thick. It is brown loam mottled with grayish brown. The part of the substratum between depths of 33 and 65 inches is dark yellowish brown sandy loam mottled with grayish brown.

Included with this soil in mapping are a few areas of Chagrin, Massanetta, Orrville, Potomac, and Tioga soils. Included soils make up about 20 percent of this map unit.

The available water capacity of the Lobdell soil is high. Permeability is moderate in the subsoil, and moderate or moderately rapid in the substratum. Runoff is medium. Natural fertility is high. This soil is moderately acid to neutral. The surface layer is friable and can be easily tilled. The seasonal high water table rises to about 1.5 feet from the surface during wet periods. It may restrict the roots of some plants. The depth to bedrock is more than 60 inches.

Most areas of this soil are used for cultivated crops or hay. Other areas are used for pasture or for home gardens.

This soil is suited to cultivated crops. The crops can be damaged by the periodic flooding. Cultivated crops can be grown year after year, but a protective cover crop is needed. The wetness often delays spring planting. Including hay in the crop rotation, applying a system of conservation tillage, growing green manure crops, and returning crop residue to the soil can help to control erosion and maintain tilth.

This soil is suited to hay and pasture. It is better suited to grasses than legumes because of the seasonal high water table. Debris may be deposited on the grassland during periods of flooding. Because the soil is soft when wet, grazing early in spring damages the sod. A planned grazing system that includes rotational grazing, proper stocking rates, cutting of hay at the proper stages of maturity, and deferment of spring grazing until the soil is firm help to control erosion and maintain the desirable species of plants.

The potential productivity of this soil for trees is moderately high. Few limitations affect woodland management, but the high natural fertility causes severe plant competition when cropland is converted to woodland. Because the soil is soft when wet, the use of equipment is restricted during wet periods. Red oak, yellow poplar, sugar maple, white oak, black cherry, and black walnut are the dominant species.

The flooding is the major hazard on sites for dwellings. The wetness also is a limitation on sites for dwellings with basements. A soil that is better suited to dwellings should be considered. Establishing a plant cover and controlling runoff help to prevent excessive erosion and stream scouring on construction sites.

The flooding and potential frost action are limitations on sites for local roads and streets. Because this soil is soft when wet, the pavement cracks under heavy loads. Constructing roads on raised fill and installing a drainage system will help to overcome the limitations.

The flooding and the wetness are limitations on sites for septic tank absorption fields. A soil that is better suited to these fields should be considered.

The capability subclass is IIw.

MaC—Mandy channery silt loam, 8 to 15 percent slopes. This soil is moderately deep, strongly sloping, and well drained. It is on ridgetops and benches mostly on Allegheny and Spruce Mountains. This soil is at high elevations where the average annual precipitation is relatively high and temperatures are cool. Slopes are generally smooth.

Typically, the surface layer is very dark brown channery silt loam about 2 inches thick. The subsoil is brown and yellowish brown channery and very channery silt loam about 20 inches thick. The substratum is yellowish brown extremely channery silt loam. It extends to bedrock at a depth of about 25 inches.

Included with this soil in mapping are small areas of moderately well drained soils. Also included are a few small areas of stony or deep soils and areas where slopes are less than 8 or more than 15 percent. Included soils make up about 20 percent of this map unit.

The available water capacity of this soil is very low or low, and permeability is moderate. Runoff is rapid. Natural fertility is low. This soil is strongly acid to extremely acid. The roots of some plants may be restricted by bedrock at a depth of 20 to 40 inches.

Most areas of this soil are in the Monongahela National Forest and are used as woodland. A few areas are used for native summer pasture. A few other areas, which locally are called sods, support mountain laurel, huckleberry, azalea, and native grasses.

This soil is not suited to the commonly grown cultivated crops because of a short growing season.

This soil is suited to hay and pasture, but the suitable species are limited because of the short growing season. Some areas are used for native summer pasture. Erosion is a severe hazard if the plant cover is removed by overgrazing. A planned grazing system that includes rotational grazing, proper stocking rates, brush management, and cutting of hay at the proper stages of maturity help to control erosion and maintain the desirable species of plants.

The potential productivity of this soil for trees is moderately high. Plant competition is moderate when openings are made in the canopy. Some trees may be uprooted during periods of heavy snowfall. Erosion on logging roads and skid trails also is a management concern. It can be controlled by building the roads and trails on the contour. Black cherry, red maple, red spruce, and American beech are the dominant species.

The slope is a moderate limitation on sites for dwellings. The depth to bedrock also is a limitation on sites for dwellings with basements. In most areas it is soft enough to be excavated with conventional earth-moving equipment. The dwellings should be designed so that they conform to the natural slope of the land. The less sloping included areas commonly are available for building site development. Establishing a plant cover and controlling runoff help to prevent excessive erosion on construction sites.

The slope is the main limitation on sites for local roads and streets. Building roads and streets on the contour helps to overcome this limitation. The bedrock may be encountered during road construction. It generally can be ripped with earth-moving equipment.

The depth to bedrock is the main limitation on sites for septic tank absorption fields. The slope also is a limitation. The less sloping areas are the best sites for these fields. Installing large absorption fields on the contour results in a more even distribution of effluent over a large area.

The capability subclass is IIIe.

MaD—Mandy channery silt loam, 15 to 25 percent slopes. This soil is moderately deep, moderately steep, and well drained. It is mostly on ridgetops and hillsides on Allegheny and Spruce Mountains. This soil is at high elevations where the average annual precipitation is relatively high and temperatures are cool. Slopes commonly are dissected by drainageways.

Typically, the surface layer is very dark brown channery silt loam about 2 inches thick. The subsoil is brown and yellowish brown channery and very channery silt loam about 20 inches thick. The substratum is yellowish brown extremely channery silt loam. It extends to bedrock at a depth of about 26 inches.

Included with this soil in mapping are small areas of moderately well drained soils. Also included are a few small areas of stony soils and areas where slopes are less than 15 or more than 25 percent. Included soils make up about 20 percent of this map unit.

The available water capacity in this soil is very low to low, and permeability is moderate. Runoff is rapid. Natural fertility is low. This soil is strongly acid to extremely acid. The roots of some plants may be restricted by bedrock at a depth of 20 to 40 inches.

Most areas of this soil are in the Monongahela National Forest and are used for woodland. A few areas are used for native summer pasture. A few other areas, which locally are called sods, support mountain laurel, huckleberry, azalea, and native grasses.

This soil is not suited to the commonly grown cultivated crops because of a short growing season.

This soil is suited to hay and pasture, but the suitable species are limited because of the short growing season. Some areas are used for native summer pasture. Erosion is a severe hazard if the plant cover is removed by overgrazing. A planned grazing system that includes rotational grazing, proper stocking rates, brush management, and cutting of hay at the proper stages of maturity help to control erosion and maintain the desirable species of plants.

The potential productivity of this soil for trees is moderately high. The slope moderately limits the operation of equipment. Erosion on logging roads and skid trails also is a management concern. It can be controlled by building the roads and trails on the contour. Plant competition is moderate when openings are made in the canopy. Some trees may be uprooted during periods of heavy snowfall. Seedling mortality is a management concern on south aspects. Black cherry, red maple, red spruce, and American beech are the dominant species.

The slope is the main limitation on sites for dwellings. The depth to bedrock also is a limitation on sites for dwellings with basements. In most areas it is soft enough to be excavated with earth-moving equipment. The dwellings should be designed so that they conform to the natural slope of the land. The less sloping areas are the best sites for dwellings. Land shaping and grading can help to overcome the slope. Establishing a plant cover and controlling runoff help to prevent excessive erosion on construction sites.

The slope is the main limitation on sites for local roads and streets. Building roads and streets on the contour helps to overcome this limitation. The bedrock commonly is encountered during road construction. It generally can be ripped with earth-moving equipment.

The slope and the depth to bedrock are limitations on sites for septic tank absorption fields. The best sites for these fields are the less sloping areas and the deeper included soils. Installing large septic tank absorption fields on the contour results in a more even distribution of effluent.

The capability subclass is IVe.

MdE—Mandy channery silt loam, 15 to 35 percent slopes, stony. This soil is moderately deep, steep or moderately steep, and well drained. It is on benches and hillsides, mostly on Allegheny and Spruce Mountains. The soil is in areas where the average annual precipitation is relatively high and temperatures are cool. Stones cover 1 to 3 percent of the surface. Slopes commonly are dissected by drainageways.

Typically, the surface layer is very dark brown channery silt loam about 2 inches thick. The subsoil is brown and yellowish brown channery and very channery silt loam about 19 inches thick. The substratum is yellowish brown extremely channery silt loam. It extends to bedrock at a depth of about 26 inches.

Included with this soil in mapping are small areas of Calvin, Trussel, and Shouns soils. Also included are a few small areas where slopes are less than 15 or more than 35 percent and a few areas of nonstony soils. Included areas make up about 30 percent of this map unit.

The available water capacity of this soil is very low or low, and permeability is moderate. Runoff is rapid or very rapid. Natural fertility is low. This soil is strongly acid to extremely acid. The roots of some plants may be restricted by bedrock at a depth of 20 to 40 inches.

Most areas of this soil are in the Monongahela National Forest and are used for woodland. A few areas are used for native summer pasture. A few other areas, which locally are called sods, support mountain laurel, huckleberry, azalea, and native grasses.

This soil is not suited to cultivated crops or hay. The stones restrict the use of farm machinery. The operation of conventional farm machinery is unsafe in the steeper areas. The commonly grown cultivated crops are limited by a short growing season.

This soil cannot be easily managed for pasture. The suitable species are limited by the short growing seasons. The slope is a severe limitation, and the stones also are a limitation. Operating the conventional equipment used in clipping and in applying fertilizer is unsafe in the steeper areas. Erosion is a severe hazard if the plant cover is removed by overgrazing. A planned grazing system that includes rotational grazing, proper stocking rates, and brush management help to control erosion and maintain the desirable species of plants.

The potential productivity of this soil for trees is moderately high. The operation of some logging equipment is unsafe in the steeper areas. Erosion on logging roads and skid trails also is a management concern. It can be controlled by building the roads and trails on the contour. Plant competition is moderate when openings are made in the canopy. Some trees may be uprooted during periods of heavy snowfall. Seedling mortality is a management concern on south aspects. Black cherry, red maple, red spruce, and American beech are the dominant species.

The slope and the depth to bedrock are the main limitations affecting most urban uses. Because this soil is moderately steep or steep and is located in the Monongahela National Forest, it seldom is used for urban development.

The capability subclass is VIIs.

MdF—Mandy channery silt loam, 35 to 55 percent slopes, stony. This soil is moderately deep, very steep, and well drained. It is on hillsides, mostly on Allegheny and Spruce Mountains. The soil is in areas where the average annual precipitation is relatively high and temperatures are cool. Stones cover 1 to 3 percent of the surface. Slopes commonly are dissected by drainageways.

Typically, the surface layer is very dark brown channery silt loam about 2 inches thick. The subsoil is brown and yellowish brown channery and very channery silt loam about 19 inches thick. The substratum is yellowish brown extremely channery silt loam. It extends to bedrock at a depth of about 25 inches.

Included with this soil in mapping are small areas of Calvin, Gauley, and Shouns soils. Also included are a few areas where slopes are less than 35 or more than 55 percent, a few areas of nonstony soils, and a few areas of Rock outcrop. Included areas make up about 30 percent of this map unit.

The available water capacity of this soil is very low or low, and permeability is moderate. Runoff is very rapid. Natural fertility is low. This soil is strongly acid to extremely acid. The roots of some plants may be restricted by bedrock at a depth of 20 to 40 inches.

Most areas of this soil are in the Monongahela National Forest and are used for woodland.

This soil is not suited to cultivated crops or hay. The slope prevents the safe operation of conventional farm machinery. The commonly grown cultivated crops also are limited by a short growing season.

This soil cannot be easily managed for pasture. The slope prevents the safe operation of the conventional equipment used in clipping and in applying fertilizer. Erosion is a very severe hazard if the plant cover is removed by overgrazing.

The potential productivity of this soil for trees is moderately high. The slope prevents the safe operation of logging equipment. Erosion on logging roads and skid trails also is a management concern. It can be controlled by building the roads and trails on the contour. Plant competition is moderate when openings are made in the canopy. Some trees may be uprooted during periods of heavy snowfall. Seedling mortality is a management concern on south aspects. Black cherry, red maple, red spruce, and American beech are the dominant species.

The slope and the depth to bedrock are the main limitations affecting most urban uses. Because this soil is very steep and is located in the Monongahela National Forest, it is seldom used for urban development. A soil that is better suited to urban uses should be considered.

The capability subclass is VIIs.

Mn—Massanetta silt loam. This soil is very deep, nearly level, and well drained. It is on narrow flood plains below springs. It is occasionally flooded. The slope ranges from 0 to 3 percent.

Typically, the surface layer is very dark gray silt loam about 10 inches thick. The subsoil is about 21 inches thick. The upper 4 inches is dark grayish brown and dark yellowish brown loam, and the lower 17 inches is dark grayish brown loam. The part of the substratum between depths of 31 and 42 inches is dark grayish brown loam mottled with yellowish red. The lower part of the substratum between depths of 42 and 65 inches is grayish brown loam mottled with yellowish red. Light gray concretions of marl are throughout the subsoil and substratum.

Included with this soil in mapping are a few areas of Dunning, Lobdell, and Orrville soils. Also included are a few areas that have slopes of more than 3 percent. Included soils make up about 35 percent of this map unit.

The available water capacity of the Massanetta soil is high, and permeability is moderate. Runoff is medium. Natural fertility is high. This soil is mildly alkaline or moderately alkaline. The surface layer is friable and can be easily tilled. The rooting depth is at least 40 inches. The depth to bedrock is more than 60 inches.

Most areas of this soil are used for pasture. In some areas marl has been mined as a source of agricultural lime.

This soil is suited to cultivated crops. The crops can be damaged by the periodic flooding. Cultivated crops can be grown year after year, but a protective cover crop is needed. Including hay in the crop rotation, applying a system of conservation tillage, growing green manure crops, and returning crop residue to the soil can help to control erosion and maintain tilth.

This soil is suited to hay and pasture. A planned grazing system that includes rotational grazing, proper stocking rates, and cutting of hay at the proper stages of maturity help to control erosion and maintain the desirable species of plants.

The potential productivity of this soil for trees is moderately high. Few limitations affect woodland management, but the high natural fertility causes severe plant competition when cropland is converted to woodland. Red oak, white oak, redcedar, and black walnut are the dominant species.

The flooding is the main limitation on sites for dwellings and septic tank absorption fields. A soil that is better suited to these fields should be selected. Establishing a plant cover and controlling runoff help to prevent excessive erosion and stream scouring on construction sites.

The flooding is the main limitation on sites for local roads and streets. Constructing roads and streets on raised fill material helps to overcome this limitation.

The capability subclass is IIw.

MoB—Monongahela silt loam, 3 to 8 percent slopes. This soil is very deep, gently sloping, and moderately well drained. It is on stream terraces along the major rivers in the county. Seep spots are common during wet months in winter and spring.

Typically, the surface layer is brown silt loam about 7 inches thick. The subsoil is about 58 inches thick. The upper 10 inches is brownish yellow and yellowish brown silt loam. The next 9 inches is yellowish brown silty clay loam mottled with dark gray and light brownish gray. The next 10 inches is firm or very firm, yellowish brown silt loam mottled with light brownish gray. The next 12 inches is very firm, strong brown cobbly silt loam mottled with light brownish gray. The lower 17 inches is light yellowish brown cobbly loam mottled with light brownish gray.

Included with this soil in mapping are a few areas of Allegheny and Tygart soils. Also included are a few areas of soils that have a cobbly surface layer, areas where slopes are less than 3 or more than 8 percent, areas of soils that have a reddish brown subsoil, and areas of soils that do not have a fragipan. Included soils make up about 30 percent of this map unit.

This soil has a moderate available water capacity. It has a fragipan. Permeability is moderate above the fragipan and moderately slow or slow in it. Runoff is medium. Natural fertility is low. This soil generally is strongly acid or very strongly acid. Many areas have been limed. The surface layer in these areas is slightly acid or neutral. The seasonal high water table rises to about 1.5 feet from the surface during wet periods. The water table and the fragipan may restrict the roots of some plants. The depth to bedrock is more than 60 inches.

Most areas of this soil are used for cultivated crops. Other areas are used for hay and pasture. A few areas are used for woodland.

This soil is suited to cultivated crops. Erosion is a moderate hazard in unprotected areas. The wetness often delays spring planting. Because of the restricted rooting depth, plants may be adversely affected by a shortage of water as the soil dries out in summer. Including hay in the crop rotation, applying a system of conservation tillage, farming on the contour, growing cover crops and green manure crops, and returning crop residue to the soil help to control erosion and maintain tilth.

This soil is suited to hay and pasture. It is better suited to grasses than legumes because of the seasonal high water table. Because the soil is soft when wet, grazing early in spring damages the sod. Erosion is a moderate hazard if the plant cover is removed by overgrazing. A planned grazing system that includes rotational grazing, proper stocking rates, deferment of spring grazing until the soil is firm, and cutting of hay at the proper stages of maturity help to control erosion and maintain the desirable species of plants.

The potential productivity of this soil for trees is moderately high. Plant competition is moderate when openings are made in the canopy. Erosion on logging roads and skid trails also is a management concern. It can be controlled by building the roads and trails on the contour. Because this soil is soft when wet, the use of equipment is restricted during wet periods. Red oak, white oak, Virginia pine, and white pine are the dominant species.

The seasonal high water table is the main limitation on sites for dwellings, especially for dwellings with basements. Installing footer drains and waterproofing walls help to keep basements dry. The well drained included soils are better sites for dwellings. Establishing a plant cover and controlling runoff help to prevent excessive erosion on construction sites.

The seasonal high water table and low strength are limitations on sites for local roads and streets. Because this soil is soft when wet, the pavement cracks under heavy loads. Constructing the road on raised fill material and installing a drainage system help to overcome the limitations.

The seasonal high water table and the moderately slow or slow permeability are limitations on sites for septic tank absorption fields. In a few areas the better drained, more rapidly permeable included soils are available for use as sites for septic tank absorption fields. Installing deep drainage tile upslope from the absorption field can be effective in lowering the seasonal high water table. Installing large absorption fields on the contour helps to overcome the moderately slow or slow permeability.

The capability subclass is IIe.

MoC—Monongahela silt loam, 8 to 15 percent slopes. This soil is very deep, strongly sloping, and moderately well drained. It is on stream terraces along the major rivers in the county. Seep spots are common during wet months in winter and spring.

Typically, the surface layer is brown silt loam about 6 inches thick. The subsoil is about 59 inches thick. The upper 11 inches is brownish yellow and yellowish brown silt loam. The next 8 inches is yellowish brown silty clay loam mottled with dark gray and light brownish gray. The next 10 inches is firm to very firm yellowish brown silt loam mottled with light brownish gray. The next 12 inches is very firm, strong brown cobbly silt loam mottled with light brownish gray. The lower 18 inches is light yellowish brown cobbly loam mottled with light brownish gray.

Included with this soil in mapping are a few areas of Allegheny and Tygart soils. Also included are a few areas of soils that have a cobbly surface layer, areas where slopes are less than 8 percent, areas of soils that have a reddish brown subsoil, and areas of soils that do not have a fragipan. Included soils make up about 30 percent of this map unit.

This soil has a moderate available water capacity. It has a fragipan. Permeability is moderate above the fragipan and moderately slow or slow in it. Runoff is rapid. Natural fertility is low. This soil generally is strongly acid or very strongly acid. Many areas have been limed. The surface layer in these areas is slightly acid or neutral. The seasonal high water table rises to about 1.5 feet from the surface during wet periods. The water table and the fragipan may restrict the roots of some plants. The depth to bedrock is more than 60 inches.

Most areas of this soil are used for hay and pasture. Other areas are used for cultivated crops. Several areas are wooded.

This soil is suited to cultivated crops. Erosion is a severe hazard in unprotected areas. The wetness often delays spring planting. Because of the restricted rooting depth, plants may be adversely affected by a shortage of water as the soil dries out in summer. Including hay in the crop rotation, applying a system of conservation tillage, farming on the contour, growing cover crops and green manure crops, contour stripcropping, returning crop residue to the soil, and establishing grassed waterways for the safe removal of concentrated runoff help to control erosion and maintain tilth.

This soil is suited to hay and pasture. It is better suited to grasses than legumes because of the seasonal high water table. Because the soil is soft when wet, grazing early in spring damages the sod. Erosion is a severe hazard if the plant cover is removed by overgrazing. A planned grazing system that includes rotational grazing, proper stocking rates, deferment of spring grazing until the soil is firm, and cutting of hay at the proper stages of maturity help to control erosion and maintain the desirable species of plants.

The potential productivity of this soil for trees is moderately high. Plant competition is moderate when openings are made in the canopy. Erosion on logging roads and skid trails also is a management concern. It can be controlled by building the roads and trails on the contour. Because this soil is soft when wet, the use of equipment is restricted during wet periods. Red oak, white oak, Virginia pine, and white pine are the dominant species.

The seasonal high water table is the main limitation on sites for dwellings, especially for dwellings with basements. The slope also is a limitation. Installing footer drains and waterproofing walls help to keep basements dry. The well drained included soils are better sites for dwellings. The dwellings should be designed so that they conform to the natural slope of the land. The less sloping areas are the best sites for dwellings. Establishing a plant cover and controlling runoff help to prevent excessive erosion on construction sites.

The seasonal high water table, low strength, and the slope are moderate limitations on sites for local roads and streets. Because this soil is soft when wet, the pavement cracks under heavy loads. Constructing the road on raised fill material and installing a drainage system help to overcome the limitations. Building the roads and streets on the contour helps to overcome the slope.

The seasonal high water table and the moderately slow or slow permeability are limitations on sites for septic tank absorption fields. In a few areas the better drained, more rapidly permeable included soils are available for use as sites for septic tank absorption fields. Installing deep drainage tile upslope from the absorption field can be effective in lowering the seasonal high water table. Installing large absorption fields on the contour helps to overcome the moderately slow or slow permeability.

The capability subclass is IIIe.

OeC—Opequon silt loam, 3 to 15 percent slopes, very rocky. This soil is shallow, strongly sloping or gently sloping, and well drained. It is on ridgetops and benches. Outcrops of limestone make up 5 to 10 percent of this unit. Sinkholes are common in some areas.

Typically, the surface layer is dark brown silt loam about 3 inches thick. The subsoil is about 13 inches thick. The upper 6 inches is yellowish red channery silty clay, and the lower 7 inches is reddish brown channery silty clay. Limestone is at a depth of about 16 inches.

Included with this soil in mapping are small areas of Edom, Elliber, and Blackthorn soils. Also included are a few areas of severely eroded or stony soils and a few areas that do not have a very rocky surface layer. Included soils make up about 25 percent of this map unit.

The available water capacity of this soil is very low, and permeability is moderate to slow. Runoff is medium or rapid. Natural fertility is high. This soil is moderately acid to mildly alkaline. The roots of some plants may be restricted by bedrock at a depth of 12 to 20 inches.

Most areas of this soil are used for pasture (fig. 5). Other areas are wooded.

This soil is not suited to cultivated crops or hay. The surface rockiness interferes with cultivation and mowing. In many places this soil is too shallow to be deeply cultivated. It also is droughty because of the depth to bedrock.

This soil is suited to pasture, but the droughtiness limits forage production during midsummer. The areas of Rock outcrop interfere with clipping. Erosion is a moderate or severe hazard if the plant cover is removed by overgrazing. Water for livestock often is scarce on this soil, and the construction of ponds commonly is unsuccessful. Springs may be available along nearby drainageways. A planned grazing system that includes rotational grazing, proper stocking rates, and brush management help to control erosion and maintain the desirable species of plants.

The potential productivity of this soil for trees is moderate. The areas of Rock outcrop and the clayey texture of the soil interfere with the use of vehicular equipment. Because the depth to bedrock restricts the roots, trees may be uprooted during periods of strong winds and heavy snowfall. Plant competition is moderate when openings are made in the canopy. The droughtiness results in a low seedling survival rate. Erosion on logging roads and skid trails also is a management concern. It can be controlled by building the roads and trails on the contour. Northern red oak, white oak, black walnut and redcedar are the dominant species.

The depth to bedrock and a high shrink-swell potential are limitations on sites for dwellings. The areas of Rock outcrop interfere with the establishment of lawns and with landscaping. The deeper included soils may be available for building site development. Because of the depth to hard limestone, building above the bedrock and landscaping with additional fill material may be preferable to excavating the rock. Extra reinforcement can help footings and foundations to withstand the pressures exerted as the soil swells during wet periods. Also, adding porous backfill adjacent to basement walls helps to reduce this pressure. Establishing a plant cover and controlling runoff help to prevent excessive erosion on construction sites.

The depth to bedrock, low strength, and the high shrink-swell potential are limitations on sites for local roads and streets. Blasting of rock may be necessary during road construction. Providing suitable subgrade can help to prevent the road damage caused by the low strength and the shrinking and swelling.

The depth to bedrock and the slow permeability are limitations on sites for septic tank absorption fields. The limestone underlying this soil is cavernous in some areas and can allow the effluent from absorption fields to pollute the ground water. A soil that is better suited to these fields should be considered.

The capability subclass is VIs.

OeE—Opequon silt loam, 15 to 35 percent slopes, very rocky. This soil is shallow, steep or moderately steep, and well drained. It is on benches and hillsides. Outcrops of limestone make up 5 to 10 percent of this unit. Sinkholes are common in some areas.

Typically, the surface layer is dark brown silt loam about 3 inches thick. The subsoil is about 11 inches thick. The upper 5 inches is yellowish red channery silty clay, and the lower 6 inches is reddish brown channery silty clay. Limestone is at a depth of about 14 inches.

Included with this soil in mapping are small areas of Edom, Elliber, and Blackthorn soils. Also included are a few areas of severely eroded or stony soils, a few areas that do not have a very rocky surface layer, and a few areas where slopes are less than 15 or more than 35 percent. Included soils make up about 25 percent of this map unit.

The available water capacity of this soil is very low, and permeability is moderate to slow. Runoff is rapid or very rapid. Natural fertility is high. This soil is moderately acid to mildly alkaline. The roots of some plants may be restricted by bedrock at a depth of 12 to 20 inches.

About half of the acreage of this soil is used for pasture. Other areas are wooded.

This soil is not suited to cultivated crops or hay. The

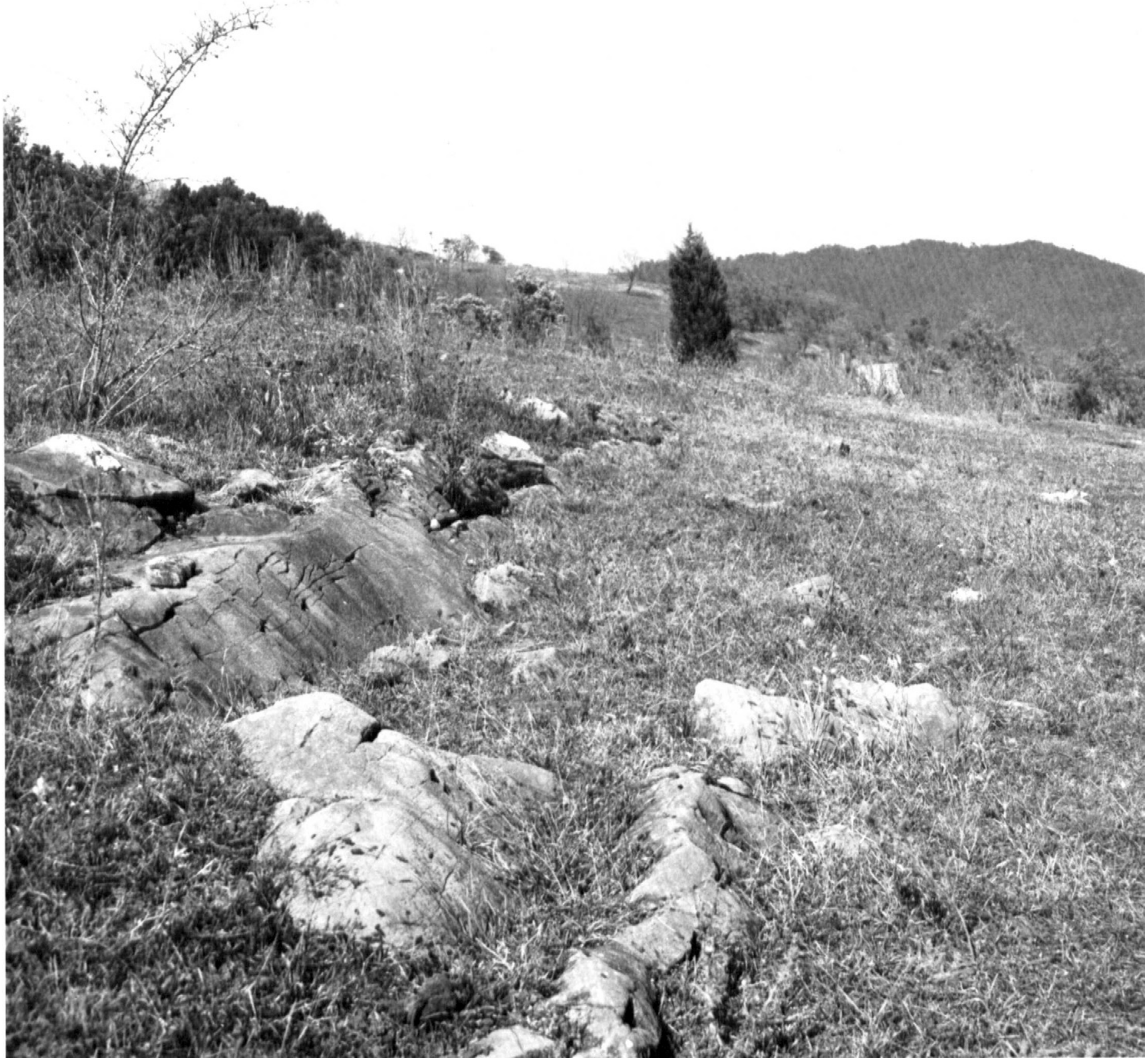

Figure 5.—Area of Opequon silt loam, 3 to 15 percent slopes, very rocky. The areas of Rock outcrop limit management of pasture.

surface rockiness interferes with cultivation, and the slope prohibits the safe use of conventional farm equipment. In many places the soil is too shallow to be deeply cultivated. It also is droughty because of the depth to bedrock.

This soil cannot be easily managed for pasture. The slope is the main limitation. The rockiness also is a limitation. Operating the conventional equipment used in clipping and in applying fertilizer is unsafe in the steeper areas. The droughtiness limits production of grasses in midsummer. Erosion is a severe hazard if the plant cover is removed by overgrazing. Water for livestock often is scarce on this soil, and the construction of ponds commonly is unsuccessful.

Springs may be available along nearby drainageways. A planned grazing system that includes rotational grazing, proper stocking rates, and brush management help to control erosion and maintain the desirable species of plants.

The potential productivity of this soil for trees is moderate. The areas of Rock outcrop, the slope, and the clayey texture limit the use of vehicular equipment. Erosion on logging roads and skid trails also is a management concern. It can be controlled by building the roads and trails on the contour. Because the depth to bedrock restricts the roots, trees may be uprooted during periods of strong winds and heavy snowfall. Plant competition is moderate when openings are made in the canopy. The droughtiness results in a low seedling survival rate. Northern red oak, white oak, black walnut, and redcedar are the dominant species.

The slope, the depth to bedrock, the slow permeability, and a high shrink-swell potential are the main limitations affecting most urban uses. A soil that is better suited to these uses should be considered.

The capability subclass is VIIs.

OeF—Opequon silt loam, 35 to 55 percent slopes, very rocky. This soil is shallow, very steep, and well drained. It is on hillsides. Outcrops of limestone make up 5 to 10 percent of this unit.

Typically, the surface layer is dark brown silt loam about 2 inches thick. The subsoil is about 12 inches thick. The upper 6 inches is yellowish red channery silty clay, and the lower 6 inches is reddish brown channery silty clay. Limestone is at a depth of about 14 inches.

Included with this soil in mapping are small areas of Dekalb, Edom, Elliber, and Blackthorn soils. Also included are a few areas of severely eroded or stony soils, a few areas that do not have a very rocky surface layer, and a few areas where slopes are less than 35 or more than 55 percent. Included soils make up about 25 percent of this map unit.

The available water capacity of this soil is very low, and permeability is moderate to slow. Runoff is very rapid. Natural fertility is high. This soil is moderately acid to mildly alkaline. The roots of some plants may be restricted by bedrock at a depth of 12 to 20 inches.

Most areas of this soil are used for woodland. Other areas are used for pasture.

This soil is not suited to cultivated crops or hay. The surface rockiness interferes with cultivation, and the slope prevents the safe use of conventional farm equipment.

This soil cannot be easily managed for pasture. The slope prevents the safe operation of the conventional equipment used in clipping and in applying fertilizer. The areas of Rock outcrop also are a limitation. The droughtiness limits the production of grasses in midsummer. Erosion is a very severe hazard if the plant cover is removed by overgrazing. Water for livestock often is scarce on this soil, but springs may be available along nearby drainageways.

The potential productivity of this soil for trees is moderate. The slope prevents the safe operation of vehicular equipment. The areas of Rock outcrop and the clayey texture also limit the use of equipment. Erosion on logging roads and skid trails also is a management concern. It can be controlled by building the roads and trails on the contour. Because the depth to bedrock restricts the roots, trees may be uprooted during periods of strong winds and heavy snowfall. Plant competition is moderate when openings are made in the canopy. The droughtiness results in a low seedling survival rate. Northern red oak, white oak, black walnut, and redcedar are the dominant species.

The slope, the depth to bedrock, the slow permeability, and a high shrink-swell potential are the main limitations affecting most urban uses. A soil that is better suited to these uses should be considered.

The capability subclass is VIIs.

OeG—Opequon silt loam, 55 to 80 percent slopes, very rocky. This soil is shallow, extremely steep, and well drained. It is on hillsides. This map unit was delineated only on maps of property managed by the United States Department of Agriculture, Forest Service, or adjacent private land. On most of the private land, this soil is included in unit OeF. Outcrops of limestone make up 5 to 10 percent of this unit.

Typically, the surface layer is dark brown silt loam about 2 inches thick. The subsoil is about 11 inches thick. The upper 5 inches is yellowish red channery silty clay, and the lower 6 inches is reddish brown channery silty clay. Limestone is at a depth of about 13 inches.

Included with this soil in mapping are small areas of Dekalb and Elliber soils. Also included are a few areas of severely eroded or stony soils, soils that are more than 20 inches deep over bedrock, and a few areas where slopes are less than 55 percent. Included soils make up about 25 percent of this map unit.

The available water capacity of this soil is very low, and permeability is moderate to slow. Runoff is very rapid. Natural fertility is high. This soil is moderately acid to mildly alkaline. The roots of some plants may be restricted by bedrock at a depth of 12 to 20 inches.

This soil is used almost exclusively for woodland.

This soil is not suited to cultivated crops, hay, or pasture. The slope prevents the use of conventional farm equipment. The hazard of erosion is very severe.

The potential productivity of this soil for trees is moderate. The slope is the main limitation. Operating conventional harvesting equipment is unsafe on this unit. Alternative methods of logging, such as cable logging, are needed. Construction of logging roads and skid trails is not recommended because of the hazard of erosion and the unsafe operating conditions. Because the depth to bedrock restricts the roots, trees may be uprooted during periods of strong winds and heavy snowfall. Plant competition is moderate when openings are made in the canopy. The droughtiness results in a low seedling survival rate. Northern red oak, white oak, black walnut, and redcedar are the dominant species.

The slope prohibits the use of this soil for dwellings, sanitary facilities, and local roads and streets. The depth to bedrock, the slow permeability, low strength, and a high shrink-swell potential also are limitations.

The capability subclass is VIIs.

OnC3—Opequon-Caneyville silty clay loams, 8 to 15 percent slopes, severely eroded. These soils are strongly sloping, well drained, and shallow and moderately deep. They are on ridgetops and benches in the area bounded by North Fork Mountain on the east and by River Knobs, along the North Fork of the South Branch of the Potomac River, on the west. Erosion has removed most of the original topsoil, and the subsoil commonly is exposed. Sinkholes are common in some places. This unit is about 45 percent Opequon soil, 35 percent Caneyville soil, and 20 percent other soils. The Opequon and Caneyville soils occur as areas so closely intermingled on the landscape that it was not practical to map them separately.

Typically, the surface layer of the Opequon soil is brown silty clay loam about 3 inches thick. The subsoil is dark brown and brown channery silty clay. It extends to limestone at a depth of about 12 inches.

Typically, the surface layer of the Caneyville soil is brown silty clay loam about 3 inches thick. The subsoil is brown and yellowish red silty clay loam and silty clay about 19 inches thick. The substratum is mixed dark brown and brown very channery silty clay. It extends to shaly limestone at a depth of about 36 inches.

Included with this unit in mapping are areas of Berks and Weikert soils, areas of soils that have a channery or stony surface layer, a few areas where slopes are less than 8 or more than 15 percent, and a few areas that are only moderately eroded. Also included are areas of soils that have less clay in the subsoil than the Opequon and Caneyville soils. Included soils make up about 20 percent of this map unit.

The available water capacity of the Opequon soil is very low, and that of the Caneyville soil is moderate to high. Permeability in the Opequon soil is moderate to slow, and that in the Caneyville soil is moderately slow. Runoff is rapid on both soils. Natural fertility is high. The Opequon soil is moderately acid to mildly alkaline. The Caneyville soil is slightly acid or neutral in the upper part and slightly acid to mildly alkaline in the lower part. The roots of some plants may be restricted by bedrock at a depth of 12 to 20 inches in the Opequon soil and 20 to 40 inches in the Caneyville soil.

Most areas of this unit are used for pasture and hay. Other areas are wooded.

This unit is not suited to cultivated crops. It is poorly suited to hay. Tilth is poor, and erosion has removed most of the organic matter and many nutrients. As a result, germination is poor and yields are limited. In some places the Opequon soil is too shallow to be deeply cultivated. It also is droughty because of the depth to bedrock. Further erosion is a very severe hazard in unprotected areas. If hay is grown on this unit, it should be established using conservation tillage practices.

This unit is suited to pasture, but the droughtiness of the Opequon soil limits forage production during midsummer. Further erosion is a very severe hazard if the plant cover is removed by overgrazing. Water for livestock often is scarce on this soil, and the construction of ponds commonly is unsuccessful. Springs may be available along nearby drainageways. A planned grazing system that includes rotational grazing, proper stocking rates, brush management, and seeding of bare areas help to control erosion and maintain the desirable species of plants.

The potential productivity of this unit for trees is moderate or moderately high. Because the depth to bedrock in the Opequon soil restricts the roots, trees on this soil may be uprooted during periods of strong winds and heavy snowfall. Plant competition is moderate when openings are made in the canopy. The droughtiness of the Opequon soil and the thin topsoil in both soils result in a low seedling survival rate. The clayey texture of the soils is a limitation for the use of vehicular equipment. Erosion on logging roads and skid trails also is a management concern. It can be controlled by building the roads and trails on the contour. Northern red oak, white oak, black walnut, and redcedar are the dominant species.

The depth to bedrock and a high shrink-swell potential are limitations on sites for dwellings. The thin topsoil interferes with establishment of lawns and with landscaping. The deeper included soils may be available for building site development. Because of the depth to the underlying hard limestone, building above the bedrock and landscaping with additional fill material may be preferable to excavating the rock. Extra reinforcement can help footings and foundations to withstand the pressure exerted as the soils swell during wet periods. Also, adding porous backfill adjacent to basement walls helps to reduce this pressure. Establishing a plant cover and controlling runoff help to prevent excessive erosion on construction sites.

The depth to bedrock, low strength, and a high shrink-swell potential are limitations on sites for local roads and streets. Blasting of rock may be necessary during road construction. Providing suitable subgrade material can help to prevent the road damage caused by the low strength and the shrinking and swelling.

The depth to bedrock and the moderately slow or slow permeability are limitations on sites for septic tank absorption fields. The underlying limestone is cavernous in some areas and can allow the effluent from absorption fields to pollute the ground water. A soil that is better suited to these fields should be considered.

The capability subclass is VIe.

OnD3—Opequon-Caneyville silty clay loams, 15 to 25 percent slopes, severely eroded. These soils are moderately steep, well drained, and shallow and moderately deep. They are on ridgetops, benches, and hillsides in the area bounded by North Fork Mountain on the east and by River Knobs, along the North Fork of the South Branch of the Potomac River, on the west. Erosion has removed most of the original topsoil, and the subsoil commonly is exposed. Sinkholes are common in some places. This unit is about 45 percent Opequon soil, 35 percent Caneyville soil, and 20 percent other soils. The Opequon and Caneyville soils occur as areas so closely intermingled in the landscape that it was not practical to map them separately.

Typically, the surface layer of the Opequon soil is brown silty clay loam about 2 inches thick. The subsoil is dark brown and brown channery silty clay. It extends to limestone at a depth of about 12 inches.

Typically, the surface layer of the Caneyville soil is brown silty clay loam about 3 inches thick. The subsoil is brown and yellowish red silty clay loam and silty clay about 19 inches thick. The substratum is mixed dark brown and brown very channery silty clay. It extends to shaly limestone at a depth of about 35 inches.

Included with this unit in mapping are areas of Berks and Weikert soils, areas of soils that have a channery or stony surface layer, a few areas where slopes are less than 15 or more than 25 percent, and a few areas that are moderately eroded. Also included are areas of soils that have less clay in the subsoil than the Opequon and Caneyville soils. Included soils make up about 20 percent of this map unit.

The available water capacity of the Opequon soil is very low, and that of the Caneyville soil is moderate to high. Permeability in the Opequon soil is moderate to slow, and that in the Caneyville soil is moderately slow. Runoff is rapid on both soils. Natural fertility is high. The Opequon soil is moderately acid to mildly alkaline. The Caneyville soil is slightly acid or neutral in the upper part and slightly acid to mildly alkaline in the lower part. The roots of some plants may be restricted by bedrock at a depth of 12 to 20 inches in the Opequon soil and 20 to 40 inches in the Caneyville soil.

Most areas of this map unit are used for pasture and hay. Other areas are wooded.

This unit is not suited to cultivated crops. It is poorly suited to hay. Tilth is poor, and erosion has removed most of the organic matter and many nutrients. As a result, germination is poor and yields are limited. In some places the Opequon soil is too shallow to be deeply cultivated. It also is droughty because of the depth to bedrock. Further erosion is a very severe hazard in unprotected areas. If hay is grown on this unit, it should be established using conservation tillage practices.

This unit cannot be easily managed for pasture. The droughtiness of the Opequon soil limits forage production during midsummer. Further erosion is a very severe hazard if the plant cover is removed by overgrazing. Water for livestock often is scarce, and construction of ponds commonly is unsuccessful. Springs may be available along nearby drainageways. A planned grazing system that includes rotational grazing, proper stocking rates, brush management, and seeding of bare areas help to control erosion and maintain the desirable species of plants.

The potential productivity of this unit for trees is moderate or moderately high. The clayey texture, slippage, and the slope severely limit the use of vehicular equipment. Because the depth to bedrock in the Opequon soil restricts roots, trees may be uprooted during periods of strong winds and heavy snowfall. Plant competition is moderate when openings are made in the canopy. The droughtiness of the Opequon soil and the thin topsoil result in a low seedling survival rate. Erosion on logging roads and skid trails also is a management concern. It can be controlled by building the roads and trails on the contour. Northern red oak, white oak, black walnut, and redcedar are the dominant species.

The slope, the depth to bedrock, a shrink-swell potential, and slippage are limitations on sites for dwellings. The thin topsoil interferes with the establishment of lawns and with landscaping. The dwellings should be designed so that they conform to the natural slope of the land. The less sloping areas are the best sites for dwellings. Land grading and shaping can help to overcome the slope. The deeper included soils may be available for building site development. Because of the underlying hard limestone, building above the bedrock and landscaping with additional fill material may be preferable to excavating the rock. Extra reinforcement can help footings and foundations to withstand the pressure exerted as the soils swell during wet periods. Also, adding porous backfill adjacent to basement walls helps to reduce this pressure. Establishing a plant cover and controlling runoff help to prevent excessive erosion on construction sites.

The slope, the depth to bedrock, low strength, and slippage are limitations on sites for local roads and streets. Blasting of rock may be necessary during road construction. Providing suitable subgrade material can help to prevent the road damage caused by the low strength. Building the roads on the contour helps to overcome the slope.

The slope, the depth to bedrock, slippage, and the moderately slow or slow permeability are limitations on sites for septic tank absorption fields. The underlying limestone is cavernous in some areas and can allow the effluent from absorption fields to pollute the ground water. A soil that is better suited to these fields should be considered.

The capability subclass is VIIe.

OnE3—Opequon-Caneyville silty clay loams, 25 to 35 percent slopes, severely eroded. These soils are steep, well drained, and shallow and moderately deep. They are on hillsides in the area bounded by North Fork Mountain on the east and by River Knobs, along the North Fork of the South Branch of the Potomac River, on the west. Erosion has removed most of the original topsoil, and the subsoil commonly is exposed. Gullies occur in some areas. This unit is about 45 percent Opequon soil, 35 percent Caneyville soil, and 20 percent other soils. The Opequon and Caneyville soils occur as areas so closely intermingled in the landscape that it was not practical to map them separately.

Typically, the surface layer of the Opequon soil is brown silty clay loam about 2 inches thick. The subsoil is dark brown and brown channery silty clay. It extends to limestone at a depth of about 12 inches.

Typically, the surface layer of the Caneyville soil is brown silty clay loam about 3 inches thick. The subsoil is brown and yellowish red silty clay loam and silty clay about 20 inches thick. The substratum is mixed dark brown and brown very channery silty clay. It extends to shaly limestone at a depth of about 34 inches.

Included with this unit in mapping are areas of Berks and Weikert soils, areas that have a channery or stony surface layer, a few areas where slopes are less than 25 or more than 35 percent, and a few areas that are only moderately eroded. Also included are areas of soils that have less clay in the subsoil than the Opequon and Caneyville soils. Included soils make up about 20 percent of this map unit.

The available water capacity of the Opequon soil is very low, and that of the Caneyville soil is moderate to high. Permeability in the Opequon soil is moderate to slow, and that in the Caneyville soil is moderately slow. Runoff is very rapid on both soils. Natural fertility is high. The Opequon soil is moderately acid to mildly alkaline. The Caneyville soil is slightly acid or neutral in the upper part and slightly acid to mildly alkaline in the lower part. The roots of some plants may be restricted by bedrock at a depth of 12 to 20 inches in the Opequon soil and 20 to 40 inches in the Caneyville soil.

Most areas of this map unit are used for pasture. Other areas are wooded.

This unit is not suited to cultivated crops or hay. Tilth is poor, and erosion has removed most of the organic matter and many nutrients. As a result, germination is poor and yields are limited. The slope limits the safe use of conventional farm equipment. In some places the Opequon soil is too shallow to be deeply cultivated. It also is droughty because of the depth to bedrock. Further erosion is a very severe hazard in unprotected areas.

This unit cannot be easily managed for pasture. The droughtiness of the Opequon soil limits forage production during midsummer. The slope limits the safe use of the conventional farm equipment used in applying fertilizer and in clipping. Further erosion is a very severe hazard if the plant cover is removed by overgrazing. Water for livestock often is scarce, but springs may be available along nearby drainageways. A planned grazing system that includes rotational grazing, proper stocking rates, brush management, and seeding of bare areas help to control erosion and maintain the desirable species of plants.

The potential productivity of this unit for trees is moderate or moderately high. Because the depth to bedrock in the Opequon soil restricts the roots, trees may be uprooted during periods of strong winds and heavy snowfall. Plant competition is moderate when openings are made in the canopy. The droughtiness of the Opequon soil and the thin topsoil result in a low seedling survival rate. Erosion on logging roads and skid trails also is a management concern. It can be controlled by building the roads and trails on the contour. The slope, slippage, and the clayey texture severely limit the use of vehicular equipment. Northern red oak, white oak, black walnut, and redcedar are the dominant species.

The slope, the depth to bedrock, the moderately slow or slow permeability, and slippage are the main limitations affecting most urban uses. A soil that is better suited to these uses should be considered.

The capability subclass is VIIe.

OnF3—Opequon-Caneyville silty clay loams, 35 to 55 percent slopes, severely eroded. These soils are very steep, well drained, and shallow and moderately deep. They are on hillsides in the area bounded by North Fork Mountain on the east and by River Knobs, along the North Fork of the South Branch of the Potomac River, on the west. Erosion has removed most of the original topsoil, and the subsoil commonly is exposed. Gullies occur in some areas. This unit is about 50 percent Opequon soil, 30 percent Caneyville soil, and 20 percent other soils. The Opequon and Caneyville soils occur as areas so closely intermingled in the landscape that it was not practical to map them separately.

Typically, the surface layer of the Opequon soil is brown silty clay loam about 1 inch thick. The subsoil is dark brown and brown channery silty clay. It extends to limestone at a depth of about 12 inches.

Typically, the surface layer of the Caneyville soil is brown silty clay loam about 2 inches thick. The subsoil is brown and yellowish red silty clay loam and silty clay about 18 inches thick. The substratum is mixed dark brown and brown very channery silty clay. It extends to shaly limestone at a depth of about 30 inches.

Included with this unit in mapping are areas of Berks and Weikert soils, areas of soils that have a channery or stony surface layer, a few areas where slopes are less than 35 or more than 55 percent, and a few areas of Rock outcrop. Also included are areas of soils that have less clay in the subsoil than the Opequon and Caneyville soils. Included soils and Rock outcrop make up about 20 percent of this map unit.

The available water capacity of the Opequon soil is very low, that of the Caneyville soil is moderate or high. Permeability in the Opequon soil is moderate to slow, and that in the Caneyville soil is moderately slow. Runoff is very rapid on both soils. Natural fertility is high. The Opequon soil is moderately acid to mildly alkaline. The Caneyville soil is slightly acid or neutral in the upper part and slightly acid to mildly alkaline in the lower part. The roots of some plants may be restricted by bedrock at a depth of 12 to 20 inches in the Opequon soil and 20 to 40 inches in the Caneyville soil.

Most areas of this unit are used for pasture. Other areas are wooded.

This unit is not suited to cultivated crops or hay. The slope prevents the safe operation of conventional farm equipment. The Opequon soil is droughty because of the depth to bedrock. Further erosion is a very severe hazard in unprotected areas.

This unit cannot be easily managed for pasture. The slope prevents the safe operation of the conventional equipment used in clipping and in applying fertilizer. The droughtiness of the Opequon soil limits forage production during midsummer. Tilth is poor, and much of the organic matter and nutrients have been removed by erosion. Further erosion is a very severe hazard if the plant cover is removed by overgrazing. Water for livestock often is scarce, but springs may be available along nearby drainageways. A planned grazing system that includes rotational grazing, proper stocking rates, brush management, and seeding of bare areas help to control erosion and maintain the desirable species of plants.

The potential productivity of this unit for trees is moderate or moderately high. Because the bedrock in the Opequon soil restricts roots, trees may be uprooted during periods of strong winds and heavy snowfall. Plant competition is moderate when openings are made in the canopy. The droughtiness of the Opequon soil and the thin topsoil result in a low seedling survival rate. Erosion on logging roads and skid trails also is a management concern. It can be controlled by building the roads and trails on the contour. The slope, slippage, and the clayey texture severely limit the use of equipment. Northern red oak, white oak, black walnut, and redcedar are the dominant species.

The slope, the depth to bedrock, the moderately slow or slow permeability, and slippage (fig. 6) are the main limitations affecting most urban uses. A soil that is better suited to these uses should be considered.

The capability subclass is VIIe.

Or—Orrville loam. This soil is very deep, nearly level, and somewhat poorly drained. It is on flood plains along the major streams in the eastern three-fourths of the county. It is occasionally flooded. Slopes range from 0 to 3 percent.

Typically, the surface layer is about 10 inches thick. It is dark grayish brown loam mottled with yellowish red. The subsoil is about 22 inches thick. The upper 4 inches is brown loam mottled with yellowish red, and the lower 18 inches is grayish brown and light gray loam mottled with strong brown. The part of the substratum between depths of 32 and 41 inches is gray silty clay loam mottled with strong brown. The lower part between depths of 41 and 65 inches is gray gravelly silty clay loam mottled with yellowish brown.

Included with this soil in mapping are a few areas of Dunning and Lobdell soils. Also included are a few areas of soils that have more sand, clay, or rock fragments than the Orrville soil. Included soils make up about 35 percent of this map unit.

The available water capacity of the Orrville soil is high. Permeability is moderate in the subsoil and moderate or moderately rapid in the substratum. Runoff is slow. Natural fertility is high. This soil is slightly acid or neutral. The surface layer is friable and can be easily

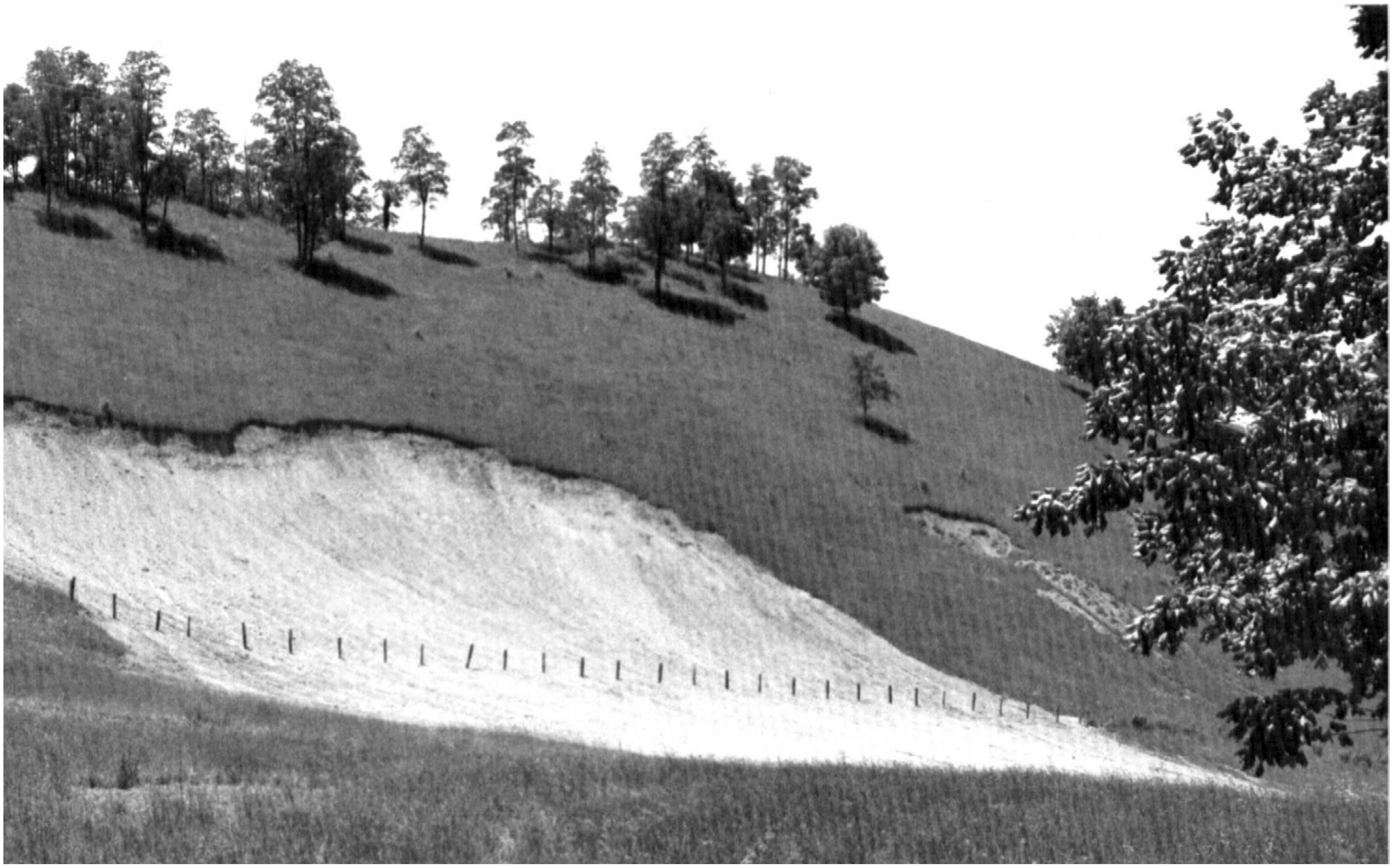

Figure 6.—Areas of Opequon-Caneyville silty clay loams, 35 to 55 percent slopes, severely eroded, are susceptible to slippage.

tilled. The seasonal high water table rises to about 1 foot from the surface during wet periods. It may restrict the roots of some plants. The depth to bedrock is more than 60 inches.

Most areas of this soil are used for pasture. Other areas are used for hay or cultivated crops. A few areas are wooded.

This soil is suited to cultivated crops, but the wetness often delays spring planting. The crops can be damaged by the periodic flooding. Crops can be planted year after year in drained areas, but a protective cover crop is needed. Including hay in the crop rotation, applying a system of conservation tillage, growing green manure crops, returning crop residue to the soil, and delaying spring tillage until the soil is dry can help to control erosion and maintain tilth.

This soil is suited to hay and pasture. It is better suited to grasses than legumes because of the seasonal high water table. Water tolerant species should be selected for planting. Unless the soil is drained, hay can be harvested only during the long, dry periods. Because the soil is soft when wet, grazing early in spring damages the sod. Debris is deposited on grassland during periods of flooding. Deferment of spring grazing until the soil is firm, a planned grazing system that includes rotational grazing, proper stocking rates, and cutting of hay at the proper stage of maturity help to control erosion and maintain the desirable species of plants.

A small acreage is wooded. The potential productivity of this soil for water tolerant trees is moderately high. Because the soil is soft when wet, the use of vehicular equipment is restricted during wet periods. Plant competition is severe. Pin oak, red oak, and sugar maple are the dominant species.

The flooding and the wetness are limitations on sites for dwellings and septic tank absorption fields. A soil that is better suited to these uses should be considered. Establishing a plant cover and controlling runoff help to prevent excessive erosion and stream scouring on construction sites.

The flooding and potential frost action are limitations on sites for local roads and streets. Because this soil is soft when wet, the pavement cracks under heavy loads. Constructing roads on raised fill and installing a drainage system helps to overcome the limitations.

The capability subclass is IIIw.

Po—Potomac fine sandy loam. This soil is very deep, nearly level, and somewhat excessively drained. It is on flood plains of most streams throughout the county. It generally is dissected by channels caused by stream scouring during flooding. It is occasionally flooded. Slopes range from 0 to 3 percent.

Typically, the surface layer is very dark grayish brown fine sandy loam about 8 inches thick. The substratum extends to a depth of 65 inches or more. The upper 6 inches is dark brown gravelly loamy sand, the next 28 inches is brown extremely gravelly sand, the next 22 inches is brown sand, and the lower 1 inch or more is brown extremely cobbly sand.

Included with this soil in mapping are a few small areas of Chagrin, Lobdell, and Tioga soils. Also included are a few areas of soils that have a very gravelly surface layer, a few areas of soils that have a reddish brown substratum, and a few areas where slopes are more than 3 percent. Included soils make up about 35 percent of this map unit.

The available water capacity of the Potomac soil is very low or low, and permeability is rapid or very rapid. Runoff is medium. Natural fertility is medium. This soil is strongly acid to neutral. The depth to bedrock is more than 60 inches.

Most areas of this soil are used for pasture and hay. Some areas are used for cultivated crops, and a few areas are wooded.

This soil has limited suitability for cultivated crops. It is droughty because of the content of sand and gravel in the substratum. In many places the gravelly and cobbly layers interfere with plowing. If cultivated crops are grown, this soil is better suited to early maturing small grain than to later maturing crops, such as corn. Crops are subject to occasional damage from flooding. Including hay in the crop rotation, applying a system of conservation tillage, growing green manure crops, and returning crop residue to the soil can help to control erosion and maintain tilth.

This soil is suited to hay and pasture, but it is droughty. Debris is deposited on grassland during periods of flooding. A planned grazing system that includes rotational grazing, proper stocking rates, and cutting of hay at the proper stages of maturity help to control erosion and maintain the desirable species of plants.

A small acreage is wooded. The potential productivity of this soil for trees is moderately high. Seedling mortality is moderate because of the droughtiness. Plant competition is moderate when openings are made in the canopy. Northern red oak, white oak, eastern white pine, and black walnut are the dominant species. Sycamore and eastern redcedar also are common.

The flooding is a hazard on sites for dwellings. A soil that is better suited to dwellings should be considered. Establishing a plant cover and controlling runoff help to prevent excessive erosion and stream scouring on construction sites.

The flooding is a limitation on sites for local roads and streets. Constructing roads on raised fill material helps to overcome this limitation. This soil commonly is used as a source of gravel for roadfill.

The flooding is a limitation on sites for septic tank absorption fields. Because of the excessive sand and gravel in the substratum, effluent from septic tank systems may not be adequately filtered before entering the ground water. A soil that is better suited to these absorption fields should be considered.

The capability subclass is IVs.

Pt—Potomac very cobbly fine sandy loam. This soil is very deep, nearly level, and somewhat excessively drained. It is on flood plains of most streams throughout the county. It commonly is dissected by channels caused by stream scouring during periods of flooding. This soil is occasionally flooded. The surface layer is 35 to 60 percent cobbles and gravel. Slopes range from 0 to 3 percent.

Typically, the surface layer is very dark grayish brown very cobbly fine sandy loam about 4 inches thick. The substratum extends to a depth of 65 inches or more. The upper 37 inches is brown extremely cobbly loamy sand, and the lower 24 inches or more is dark brown and brown extremely gravelly loamy sand.

Included with this soil in mapping are a few small areas of Chagrin, Lobdell, and Tioga soils. Also included are a few areas of soils that do not have a very cobbly surface layer, a few areas of soils that have a reddish brown substratum, and a few areas where slopes are more than 3 percent. Included soils make up about 35 percent of this map unit.

The available water capacity of the Potomac soil is very low or low, and permeability is rapid or very rapid. Runoff is medium. Natural fertility is medium. This soil is strongly acid to neutral. The depth to bedrock is more than 60 inches.

Most areas of this soil are used for pasture. Some areas are used for hay, cultivated crops, or woodland.

This soil is not suited to cultivated crops or hay. The rock fragments in the surface layer restrict cultivation. This soil is droughty because of the excessive sand, cobbles, and pebbles in the substratum. Crops are subject to damage from the occasional flooding.

This soil is suited to pasture, but it is droughty. The rock fragments in the surface layer restrict the renovation of pastures. Debris is deposited on grassland during periods of flooding. A planned grazing system that includes rotational grazing and proper stocking rates help to control erosion and maintain the desirable species of plants.

A small acreage is wooded. The potential productivity of this soil for trees is moderately high. The droughtiness results in a moderate seedling mortality rate. Plant competition is moderate when openings are made in the canopy. Northern red oak, white oak, eastern white pine, and black walnut are the dominant species. Sycamore and eastern redcedar also are common.

The flooding is a limitation on sites for dwellings. The rock fragments in the surface layer interfere with the establishment of lawns. A soil that is better suited to dwellings should be considered. Establishing a plant cover and controlling runoff help to prevent excessive erosion and stream scouring on construction sites.

The flooding is a limitation on sites for local roads and streets. Constructing roads on raised fill material helps to overcome this limitation. This soil commonly is used as a source of gravel for roadfill.

The flooding is a limitation on sites for septic tank absorption fields. Because of the excessive sand and gravel in the substratum, effluent from septic tank systems may not be adequately filtered before entering the ground water. A soil that is better suited to these absorption fields should be considered.

The capability subclass is Vs.

Pu—Purdy silt loam. This soil is very deep, nearly level, and poorly drained or very poorly drained. It is on terraces of the major streams in the eastern three-fourths of the county. Water commonly is ponded on the surface. Slopes range from 0 to 3 percent.

Typically, the surface layer is about 6 inches thick. It is dark grayish brown silt loam mottled with yellowish red. The subsoil is about 30 inches thick. The upper 5 inches is grayish brown silt loam mottled with strong brown, the next 17 inches is dark gray silty clay mottled with red and strong brown, and the lower 8 inches is dark gray silty clay mottled with strong brown. The part of the substratum between depths of 36 and 65 inches is dark gray silty clay mottled with light olive brown and grayish brown.

Included with this soil in mapping are a few areas of Tygart soils, a few areas of gently sloping soils, and a few areas of soils that have a black surface layer. Included soils make up about 25 percent of this map unit.

The available water capacity of the Purdy soil is high, and permeability is slow or very slow. Runoff is slow. Natural fertility is low or medium. This soil generally is strongly acid to extremely acid. Some areas have been limed. The surface layer in these areas is slightly acid or neutral. The seasonal high water table is at or near the surface during wet periods. It may restrict the roots of some plants. The depth to bedrock is more than 60 inches.

Most areas of this soil are used for pasture. Some areas have been drained and are used for hay or cultivated crops. A few areas are wooded.

This soil has limited suitability for cultivated crops. The wetness often delays spring planting. Drainage is difficult because of the slow or very slow permeability in the clayey subsoil. Crops can be planted year after year in areas that have been drained, but a protective cover crop is needed. Including hay in the crop rotation, applying a system of conservation tillage, growing green manure crops, returning crop residue to the soil, and delaying spring tillage until the soil is dry help to control erosion and maintain tilth.

This soil is suited to hay and pasture. It is better suited to grasses than legumes because of the seasonal high water table. Unless this soil is drained, harvesting of hay commonly is restricted to the long, dry periods. Water tolerant species should be selected for planting. Because the soil is soft when wet, grazing early in spring damages the sod. Deferment of spring grazing until the soil is firm, a planned grazing system that includes rotational grazing, proper stocking rates, and cutting of hay at the proper stages of maturity help to control erosion and maintain the desirable species of plants.

The potential productivity of this soil for water tolerant trees is moderately high. Because the soil is soft when wet, the use of vehicular equipment is restricted. Plant competition is severe when openings are made in the canopy, and the seedling mortality rate is high. Pin oak, Virginia pine, and American sycamore are the dominant species.

The wetness is the main limitation on sites for dwellings. Installing footer drains and waterproofing walls help to keep basements dry. Some areas are ponded following heavy rains. Land shaping and grading are needed to divert surface runoff away from dwellings.

The wetness, low strength, and potential frost action are limitations on sites for local roads and streets. Because this soil is soft when wet, the pavement cracks under heavy loads. Constructing roads on raised fill material and installing a drainage system help to overcome the limitations.

The wetness and the slow or very slow permeability

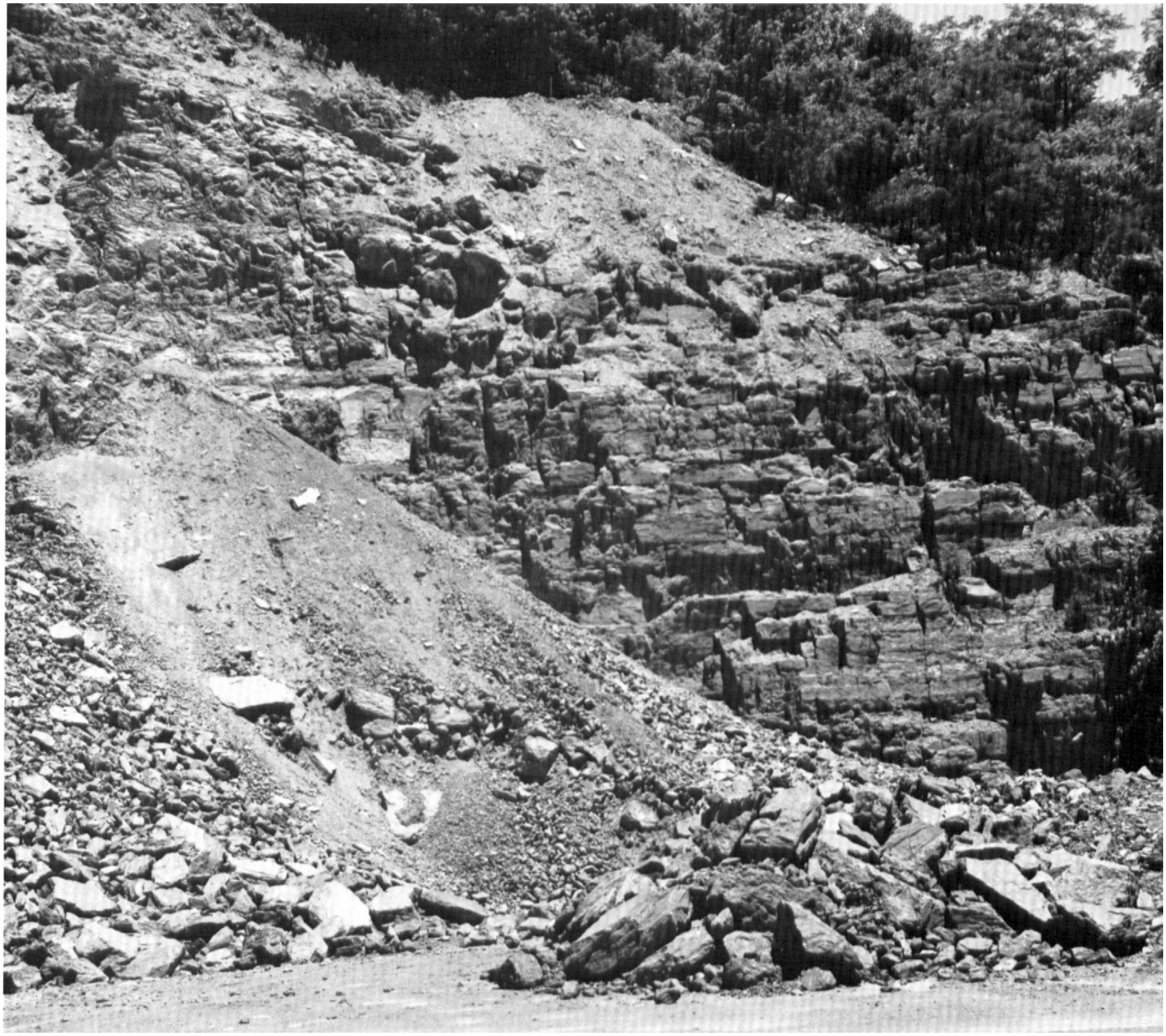

Figure 7.—Limestone quarries are characterized by vertical high walls and areas of rock fragments and exposed bedrock.

are limitations on sites for septic tank absorption fields. Alternative disposal systems or a soil that is better suited to these fields should be considered.

The capability subclass is IVw.

Qu—Quarry, limestone. Limestone has been excavated from these areas for use as gravel or as a source of agricultural lime. The unit consists of gently sloping or strongly sloping areas of exposed limestone and rock fragments and of vertical high walls (fig. 7).

Included with this unit in mapping are areas of Elliber soils from which cherty material has been excavated for use as fill material in the construction and maintenance of roads.

This unit is droughty. Because most areas consist of exposed rock, plants cannot become established.

This unit is not suited to cultivated crops, hay, pasture, or woodland. The areas of exposed rock and the vertical slopes restrict its use for dwellings, roads and streets, and septic tank absorption fields.

The quarries that are too small to delineate on the soil maps are shown by a special symbol on the maps. This symbol also was used to show small quarries from which shale has been excavated, mostly for use as base material for roads.

The capability subclass is VIIIs.

Ro—Rock outcrop and Rubble land. These gently sloping to extremely steep areas of exposed bedrock, boulders, and stones are on hillsides and ridgetops. The outcrops of rock and the rock fragments are dominantly sandstone but are limestone in some areas. The total acreage of this map unit is about 50 percent Rock outcrops, 40 percent Rubble land, and 10 percent included soils. Some areas are mostly Rock outcrop, some are mostly Rubble land, and some are both. The areas of Rock outcrop and Rubble land were mapped together because there are no major differences in the use and management of the areas.

Included with this unit in mapping are a few areas of Dekalb, Hazleton, Laidig, Lehew, Gauley, and Opequon soils. Included soils make up about 10 percent of this map unit.

Areas of this unit are very sparsely vegetated with Virginia pine, chestnut oak, and scrub oak. Most of the unit is in remote areas. It is used mainly for esthetic value, wildlife habitat, and recreation activities, such as rock climbing. This unit includes well-known areas such as Seneca Rocks, Eagle Rock, and Champe Rocks.

This unit is not suited to cultivated crops, hay, pasture, or woodland. The outcrops of rock, the rock fragments, and the slope restrict its use for dwellings, roads and streets, and septic tank absorption fields.

The capability subclass is VIIIs.

RuF—Rushtown channery silt loam, 35 to 55 percent slopes. This soil is very steep, very deep, and excessively drained. It is mostly on hillsides in the eastern three-fourths of the county. The rock fragments in the soil are dominantly shale.

Typically, the surface layer is about 7 inches thick. The upper 4 inches is dark brown channery silt loam, and the lower 3 inches is brown channery silt loam. The subsoil is brown very channery silt loam about 27 inches thick. The part of the substratum between depths of 34 and 65 inches is brown extremely channery silt loam.

Included with this soil in mapping are a few areas of Berks and Weikert soils and a few areas that are severely eroded. These included soils make up about 20 percent of this map unit. Also included are areas where slopes are less than 35 percent. These areas make up about 40 percent of the unit.

The available water capacity of the Rushtown soil is low to high, and permeability is rapid or very rapid. Runoff is rapid. Natural fertility is low. This soil is moderately acid to very strongly acid. The depth to bedrock is more than 60 inches.

Most areas of this soil are wooded. Some areas are used for pasture.

This soil is not suited to cultivated crops or hay. The slope prevents the safe use of conventional farm equipment. Erosion is a very severe hazard in unprotected areas.

This soil cannot be easily managed for pasture. The slope prevents the safe operation of the conventional farm equipment used in clipping and in applying fertilizer. The hazard of erosion is very severe if the plant cover is removed by overgrazing.

The potential productivity of this soil for trees is moderate. The slope prevents the safe operation of logging equipment. Because the soil often is droughty, seedling mortality also is a limitation. Erosion is a severe hazard following logging activities. Plant competition is moderate when openings are made in the canopy. Red oak, Virginia pine, black oak, white oak, chestnut oak, and white pine are the dominant species.

The slope is the main limitation affecting most urban uses. A soil that is better suited to these uses should be considered.

The capability subclass is VIIe.

ShC—Shouns channery loam, 3 to 15 percent slopes, stony. This soil is strongly sloping or gently sloping, well drained, and very deep. It is on foot slopes and benches, along drainageways, and in coves, mainly on the lower slopes of Shenandoah Mountain. Stones cover 1 to 3 percent of the surface.

Typically, the surface layer is about 5 inches thick. The upper 2 inches is dark brown channery loam, and the lower 3 inches is yellowish red channery loam. The subsoil is about 40 inches thick. The upper 18 inches is reddish brown channery loam, and the lower 22 inches is dark red channery loam. The part of the substratum between depths of 45 and 65 inches is reddish brown channery silt loam.

Included with this soil in mapping are a few areas of Berks, Calvin, Dekalb, Hazleton, Laidig, and Potomac soils and a few areas where slopes are more than 15 percent. Also included are a few areas that have more sand in the subsoil than the Shouns soil and a few areas that are very stony. Included soils make up about 25 percent of this map unit.

The available water capacity of the Shouns soil is high, and permeability is moderate. Runoff is rapid or medium. Natural fertility is low to medium. This soil generally is moderately acid to very strongly acid. Some areas have been limed. The surface layer in these areas is slightly acid or neutral. The depth to bedrock is more than 60 inches.

Most areas of this soil are used for woodland. Some areas are used for pasture.

This soil is not suited to cultivated crops. The surface stoniness is the main limitation. Areas that are cleared of stones are suited to hay, but the stones beneath the surface would interfere with cultivation of crops.

This soil is suited to pasture. The stones interfere with clipping. Erosion is a severe or moderate hazard if the plant cover is removed by overgrazing. A planned grazing system that includes rotational grazing, proper stocking rates, and brush management help to control erosion and maintain the desirable species of plants.

The potential productivity of this soil for trees is moderately high. Few limitations affect woodland management, but plant competition is severe when openings are made in the canopy. Erosion on logging roads and skid trails also is a management concern. It can be controlled by building the roads and trails on the contour. Red oak, white oak, Virginia pine, and white pine are the dominant species.

The slopes of more than 8 percent are a moderate limitation on sites for dwellings. The stones interfere with the establishment of lawns and with landscaping. The dwellings should be designed so that they conform to the natural slope of the land. The less sloping areas are the best sites for dwellings. Stones can be removed from lawn areas. Establishing a plant cover and controlling runoff help to prevent excessive erosion on construction sites.

The slopes of more than 8 percent are the main limitation on sites for local roads and streets. Building the roads on the contour helps to overcome this limitation. Potential frost action and low strength also are limitations.

The slopes of more than 8 percent are the main limitation on sites for septic tank absorption fields. Installing the absorption fields on the contour results in a more even distribution of effluent.

The capability subclass is VIs.

ShE—Shouns channery loam, 15 to 35 percent slopes, stony. This soil is steep or moderately steep, well drained, and very deep. It is on foot slopes and benches, along drainageways, and in coves, mainly on the lower slopes of Shenandoah Mountain. Stones cover 1 to 3 percent of the surface.

Typically, the surface layer is about 4 inches thick. The upper 2 inches is dark brown channery loam, and the lower 2 inches is yellowish red channery loam. The subsoil is about 41 inches thick. The upper 19 inches is reddish brown channery loam, and the lower 22 inches is dark red channery loam. The part of the substratum between depths of 45 and 65 inches is reddish brown channery silt loam.

Included with this soil in mapping are a few areas of Berks, Calvin, Dekalb, Hazleton, and Laidig soils. Also included are a few areas where slopes are less than 15 or more than 35 percent, a few areas that have more sand in the subsoil than the Shouns soil, and a few areas that are very stony. Included soils make up about 25 percent of this map unit.

The available water capacity of the Shouns soil is high, and permeability is moderate. Runoff is rapid or very rapid. Natural fertility is low to medium. This soil is moderately acid to very strongly acid. The depth to bedrock is more than 60 inches.

Most areas of this soil are used for woodland. A few areas are used for pasture.

This soil is not suited to cultivated crops. The surface stoniness and the slope are the main limitations. The less sloping areas that are cleared of stones are suited to hay, but the stones beneath the surface would interfere with cultivation of crops.

This soil cannot be easily managed for pasture. The slope is the main limitation. The stones also are a limitation. Operating the conventional equipment used in clipping and in applying fertilizer is unsafe in the steeper areas. Erosion is a severe hazard if the plant cover is removed by overgrazing. A planned grazing system that includes rotational grazing, proper stocking rates, and brush management help to control erosion and maintain the desirable species of plants.

The potential productivity of this soil for trees is moderately high. The slope restricts the use of vehicular equipment. Plant competition is severe when openings are made in the canopy. Erosion on logging roads and skid trails also is a management concern. It can be controlled by building the roads and trails on the contour. Seedling mortality is a management concern on south aspects. Red oak, white oak, Virginia pine, and white pine are the dominant species.

The slope is the main limitation affecting most urban uses. A soil that is better suited to these uses should be considered.

The capability subclass is VIIs.

SnC—Shouns channery loam, 3 to 15 percent slopes, very stony. This soil is strongly sloping or gently sloping, well drained, and very deep. It is on foot slopes and benches, along drainageways, and in coves, mainly in the western part of the county. Stones cover 3 to 15 percent of the surface.

Typically, the surface layer is about 6 inches thick. The upper 3 inches is dark brown channery loam, and the lower 3 inches is yellowish red channery loam. The subsoil is about 40 inches thick. The upper 18 inches is reddish brown channery loam, and the lower 22 inches is dark red channery loam. The part of the substratum between depths of 46 and 65 inches is reddish brown channery silt loam.

Included with this soil in mapping are a few areas of Belmont, Cateache, Dekalb, and Hazleton soils. Also included are a few areas where slopes are more than 15 percent, a few areas that have a fragipan, some areas that have more sand in the subsoil than the Shouns soil, and a few areas that are rubbly. Included soils and areas of Rubble land make up about 25 percent of this map unit.

The available water capacity of the Shouns soil is high, and permeability is moderate. Runoff is rapid or medium. Natural fertility is low to medium. This soil generally is moderately acid to very strongly acid. Some areas have been limed. The surface layer in these areas is slightly acid or neutral. The depth to bedrock is more than 60 inches.

Most areas of this soil are used for woodland. A few areas are used for pasture.

This soil is not suited to cultivated crops. The surface stoniness prevents the operation of conventional farm equipment. Areas that are cleared of stones are suited to hay, but the stones beneath the surface would interfere with cultivation of crops.

This soil cannot be easily managed for pasture. The stones interfere with the operation of the equipment used in clipping and in applying fertilizer. Erosion is a severe or moderate hazard if the plant cover is removed by overgrazing. This soil is poorly suited to the construction of successful ponds, but springs commonly are available for watering livestock. A planned grazing system that includes rotational grazing, proper stocking rates, and brush management help to control erosion and maintain the desirable species of plants.

The potential productivity of this soil for trees is moderately high. The stones interfere with the operation of vehicular equipment. The stones and other rock fragments in the surface layer interfere with the planting of seedlings. Erosion on logging roads and skid trails also is a management concern. It can be controlled by building the roads and trails on the contour. Plant competition is severe when openings are made in the canopy. Red oak, sugar maple, black cherry, and American basswood are the dominant species.

The slopes of more than 8 percent are the main limitation on sites for dwellings. The stones interfere with the establishment of lawns and with landscaping. The dwellings should be designed so that they conform to the natural slope of the land. The less sloping areas are the best sites for dwellings. Stones can be removed from lawn areas. Establishing a plant cover and controlling runoff help to prevent excessive erosion on construction sites.

The slopes of more than 8 percent are the main limitation on sites for local roads and streets. Building the roads on the contour helps to overcome this limitation. Potential frost action and low strength also are limitations.

The slopes of more than 8 percent are the main limitation on sites for septic tank absorption fields. The stones also are a limitation. Installing the absorption fields on the contour results in a more even distribution of effluent.

The capability subclass is VIIs.

SnE—Shouns channery loam, 15 to 35 percent slopes, very stony. This soil is steep or moderately steep, well drained, and very deep. It is on foot slopes and benches, along drainageways, and in coves, mainly in the western part of the county. Stones cover 3 to 15 percent of the surface.

Typically, the surface layer is about 5 inches thick. The upper 2 inches is dark brown channery loam, and the lower 3 inches is yellowish red channery loam. The subsoil is about 41 inches thick. The upper 19 inches is reddish brown channery loam, and the lower 22 inches is dark red channery loam. The part of the substratum between depths of 46 and 65 inches is reddish brown channery silt loam.

Included with this soil in mapping are a few areas of Belmont, Cateache, Dekalb, and Hazleton soils, a few areas where slopes are less than 15 or more than 35 percent, and a few areas that have more sand in the subsoil than the Shouns soil. Also included are some areas that have a fragipan and a few areas that are rubbly. Included soils make up about 25 percent of this map unit.

The available water capacity of the Shouns soil is high, and permeability is moderate. Runoff is rapid or very rapid. Natural fertility is low to medium. This soil is moderately acid to very strongly acid. The depth to bedrock is more than 60 inches.

Most areas of this soil are used for woodland. A few areas are used for pasture.

This soil is not suited to cultivated crops. The surface stoniness and the slope are the main limitations. The less sloping areas that are cleared of stones are suited to hay, but the stones beneath the surface would interfere with cultivation of crops.

This soil cannot be easily managed for pasture. The slope is the main limitation. The stones also are a limitation. Operating the conventional equipment used in clipping and in applying fertilizer is unsafe in the steeper areas. Erosion is a severe hazard if the plant cover is removed by overgrazing. This soil is poorly suited to the construction of successful ponds, but springs commonly are available for watering livestock. A planned grazing system that includes rotational grazing, proper stocking rates, and brush management help to control erosion and maintain the desirable species of plants.

The potential productivity of this soil for trees is moderately high. The slope and the stones limit the use of vehicular equipment. The stones and other rock fragments in the surface layer interfere with the planting of seedlings. Seedling mortality is a management concern on south aspects. Plant competition is severe when openings are made in the canopy. Erosion on logging roads and skid trails also is a management concern. It can be controlled by building the roads and trails on the contour. Red oak, sugar maple, black cherry, and American basswood are the dominant species.

The slope is the main limitation affecting most urban uses. The stones also are a limitation. A soil that is better suited to these uses should be considered.

The capability subclass is VIIs.

SnF—Shouns channery loam, 35 to 55 percent slopes, very stony. This soil is very steep, well drained, and very deep. It is on concave hillsides, mainly in the western part of the county. Stones cover 3 to 15 percent of the surface.

Typically, the surface layer is about 4 inches thick. The upper 2 inches is dark brown channery loam, and the lower 2 inches is yellowish red channery loam. The subsoil is about 41 inches thick. The upper 18 inches is reddish brown channery loam, and the lower 23 inches is dark red channery loam. The part of the substratum between depths of 45 and 65 inches is reddish brown channery silt loam.

Included with this soil in mapping are a few areas of Belmont, Cateache, Dekalb, and Hazleton soils. Also included are a few areas where slopes are less than 35 percent, a few areas that have more sand in the subsoil than the Shouns soil, and a few areas that are rubbly. Included soils make up about 25 percent of this map unit.

The available water capacity of the Shouns soil is high, and permeability is moderate. Runoff is very rapid. Natural fertility is low to medium. This soil is moderately acid to very strongly acid. The depth to bedrock is more than 60 inches.

This soil is used for woodland.

This soil is not suited to cultivated crops or hay. The slope prevents the safe operation of conventional farm equipment.

This soil cannot be easily managed for pasture. The slope prevents the safe operation of the conventional equipment used in clipping and in applying fertilizer. The stones also are a limitation. The hazard of erosion is very severe if the plant cover is removed by overgrazing.

The potential productivity of this soil for trees is moderately high. The slope prevents the safe operation of vehicular equipment. Erosion on logging roads and skid trails also is a management concern. It can be controlled by building the roads and trails on the contour. The stones and other rock fragments in the surface layer interfere with the planting of seedlings. Seedling mortality is a management concern on south aspects. Plant competition is severe when openings are made in the canopy. Red oak, sugar maple, black cherry, and American basswood are the dominant species.

The slope is the main limitation affecting most urban uses. The stones also are a limitation. A soil that is better suited to these uses should be considered.

The capability subclass is VIIs.

SoC—Shouns channery loam, 3 to 15 percent slopes, rubbly. This soil is strongly sloping or gently sloping, well drained, and very deep. It is on foot slopes and benches, along drainageways, and in coves in the western part of the county. Stones and boulders cover 50 to 90 percent of the surface.

Typically, the surface layer is about 6 inches thick. The upper 3 inches is dark brown channery loam, and the lower 3 inches is yellowish red channery loam. The subsoil is about 40 inches thick. The upper 18 inches is reddish brown channery loam, and the lower 22 inches is dark red channery loam. The part of the substratum between depths of 46 and 65 inches is reddish brown channery silt loam.

Included with this soil in mapping are a few areas of Rock outcrop and Rubble land, a few small areas of poorly drained soils, and a few areas that have a fragipan. Also included are a few areas where slopes are more than 15 percent, a few areas that have more sand in the subsoil than the Shouns soil, and a few areas that are less stony. Included soils and areas of Rock outcrop and Rubble land make up about 25 percent of this map unit.

The available water capacity of the Shouns soil is high, and permeability is moderate. Runoff is rapid or medium. Natural fertility is low to medium. This soil is moderately acid to very strongly acid. The depth to bedrock is more than 60 inches.

This soil is used for woodland.

This soil is not suited to cultivated crops, hay, or pasture. The stones and boulders prevent the operation of conventional farm equipment.

The potential productivity of this soil for trees is moderate. The stones and boulders restrict the use of logging equipment and seriously interfere with replanting after logging activities. Plant competition is severe when openings are made in the canopy. Erosion on logging roads and skid trails also is a management concern. It can be controlled by building the roads and skid trails on the contour. The rate of seedling mortality is high. Red oak, sugar maple, black cherry, and American basswood are the dominant species.

The stones and boulders are the main limitations on sites for dwellings, local roads and streets, and septic tank absorption fields. Because of the stones and boulders and the remoteness of the soil, this unit is seldom used as a site for these uses. A soil that is better suited should be considered.

The capability subclass is VIIs.

SoE—Shouns channery loam, 15 to 35 percent slopes, rubbly. This soil is steep or moderately steep, well drained, and very deep. It is on foot slopes and benches, along drainageways, and in coves in the western part of the county. Stones and boulders cover 50 to 90 percent of the surface.

Typically, the surface layer is about 4 inches thick. The upper 2 inches is dark brown channery loam, and the lower 2 inches is yellowish red channery loam. The subsoil is about 41 inches thick. The upper 19 inches is reddish brown channery loam, and the lower 22 inches is dark red channery loam. The part of the substratum between depths of 45 and 65 inches is reddish brown channery silt loam.

Included with this soil in mapping are a few areas of Rock outcrop and Rubble land and a few areas where slopes are less than 15 or more than 35 percent. Also included are a few areas that have more sand in the subsoil than the Shouns soil and a few areas that are less stony. Included soils and areas of Rock outcrop and Rubble land make up about 25 percent of this map unit.

The available water capacity of the Shouns soil is high, and permeability is moderate. Runoff is rapid or very rapid. Natural fertility is low to medium. This soil is moderately acid to very strongly acid. The depth to bedrock is more than 60 inches.

This soil is used for woodland.

This soil is not suited to cultivated crops, hay, or pasture. The stones and boulders and the slope prevent the operation of conventional farm equipment.

The potential productivity of this soil for trees is moderate. The stones and boulders and the slope restrict the operation of vehicular equipment. Erosion on logging roads and skid trails also is a management concern. It can be controlled by building the roads and trails on the contour. The stones and boulders seriously interfere with the planting of seedlings after logging. The rate of seedling mortality is high. Plant competition is severe when openings are made in the canopy. Red oak, sugar maple, black cherry, and American basswood are the dominant species.

The slope and the stones and boulders are limitations affecting most urban uses. Because of these limitations and the remoteness of the soil, this unit is seldom used as a site for urban uses. A soil that is better suited to these uses should be considered.

The capability subclass is VIIs.

SoF—Shouns channery loam, 35 to 55 percent slopes, rubbly. This soil is very steep, well drained, and very deep. It is on concave hillsides in the western part of the county. Stones and boulders cover 50 to 90 percent of the surface.

Typically, the surface layer is about 4 inches thick. The upper 2 inches is dark brown channery loam, and the lower 2 inches is yellowish red channery loam. The subsoil is about 41 inches thick. The upper 18 inches is reddish brown channery loam, and the lower 23 inches is dark red channery loam. The part of the substratum between depths of 45 and 65 inches is reddish brown channery silt loam.

Included with this soil in mapping are a few areas of Rock outcrop and Rubble land and a few small areas of Cateache soils. Also included are a few areas where slopes are less than 35 or more than 55 percent, a few areas that have more sand in the subsoil than the Shouns soil, and a few areas that are less stony. Included soils and areas of Rock outcrop and Rubble land make up about 25 percent of this map unit.

The available water capacity of the Shouns soil is high, and permeability is moderate. Runoff is very rapid. Natural fertility is low to medium. This soil is moderately acid to very strongly acid. The depth to bedrock is more than 60 inches.

This soil is used for woodland.

This soil is not suited to cultivated crops, hay, or pasture. The stones and boulders and the slope prevent the safe operation of conventional farm equipment.

The potential productivity of this soil for trees is moderate. The stones and boulders and the slope restrict the operation of vehicular equipment. The stones and boulders seriously interfere with the planting of seedlings after logging. The rate of seedling mortality is high. Erosion on logging roads and skid trails also is a management concern. It can be controlled by building the roads and trails on the contour. Plant competition is severe when openings are made in the canopy. Red oak, sugar maple, black cherry, and American basswood are the dominant species.

The slope and the stones and boulders are limitations affecting most urban uses. Because of these limitations and the remoteness of the soil, this unit seldom is used as a site for urban uses. A soil that is better suited should be considered.

The capability subclass is VIIs.

SrB—Simoda channery loam, 3 to 15 percent slopes, extremely stony. This soil is gently sloping to strongly sloping, deep or very deep, and moderately well drained. It is on ridgetops and benches along the top of Spruce Mountain and on Roaring Plains. Stones cover 15 to 50 percent of the surface. Slopes generally are smooth. Seep spots are common on this soil. This soil is at high elevations where the average annual precipitation is high and temperatures are cool.

Typically, the surface layer is very dark brown channery loam about 5 inches thick. The subsoil is about 35 inches thick. The upper 21 inches is strong brown and yellowish brown channery loam. The lower 14 inches is yellowish brown, very firm and brittle, channery sandy loam mottled with yellowish red and light brownish gray. The substratum is yellowish brown channery silty clay loam mottled with light brownish gray. It extends to a depth of 65 inches or more.

Included with this soil in mapping are a few areas of very poorly drained soils, a few small areas of Gauley and Mandy soils, a few areas of Rock outcrop and Rubble land, and areas where slopes are more than 15 percent. Included soils and areas of Rock outcrop and Rubble land make up about 20 percent of the map unit.

The Simoda soil has a moderate available water capacity. It has a fragipan. Permeability is moderate above the fragipan and slow in it. Natural fertility is low. Runoff is medium or rapid. This soil is extremely acid to strongly acid. The seasonal high water table is within a depth of 1.5 to 2.5 feet of the surface during wet periods. The roots of some plants may be restricted by the fragipan and the water table. The depth to bedrock is more than 40 inches.

Most areas of this soil are wooded with brushy species. Several nonwooded areas, which locally are called sods, support hawthorn, mountain laurel, blueberry, rhododendron, azalea, and native grasses. Most of this unit is in remote areas of the Monongahela National Forest. The unit is used mainly for recreation and botanical study.

This soil is not suited to cultivated crops, hay, or pasture. The stones and boulders prevent the operation of conventional farm equipment. Because of the altitude, the growing season is short. This limits the production of the commonly grown crops. A few areas are used for native summer pasture.

The potential productivity of this soil for red spruce trees is high. The wetness restricts the use of vehicular equipment during winter and spring. The stones and boulders interfere with the use of logging equipment. The rate of seedling mortality is high. Erosion on logging roads and skid trails also is a management concern. It can be controlled by building the roads and trails on the contour. The stones and boulders seriously interfere with the planting of seedlings after logging. Red spruce, red maple, black cherry, and yellow birch are the dominant species. The height of these trees often is restricted by the strong westerly winds and the harsh climate. Limbs generally are concentrated on the east-facing side of the trees, and the west-facing side is nearly bare. The undergrowth commonly is brushy and dense and almost impenetrable.

The wetness is a limitation on sites for dwellings, especially for dwellings with basements. The stones and boulders interfere with the establishment of lawns and with landscaping. Because this soil is in remote areas, it seldom is used as a site for dwellings.

The wetness and potential frost action are limitations on sites for local roads and streets. The slope and stones also are limitations. Because this soil is soft when wet, the pavement cracks under heavy loads. Constructing roads on raised fill material and installing a drainage system help to overcome the wetness and potential frost action. Building the roads on the contour helps to overcome the slope.

The wetness and the slow permeability are limitations on sites for septic tank absorption fields. Because this soil is in remote areas, it seldom is used as a site for these fields. A soil that is better suited should be considered.

The capability subclass is VIIs.

Tg—Tioga loam. This soil is very deep, nearly level, and well drained. It is on the flood plains along the major streams in the eastern three-fourths of the county. It is occasionally flooded. Slopes range from 0 to 3 percent.

Typically, the surface layer is about 11 inches thick. The upper 8 inches is brown loam, and the lower 3 inches is brown fine sandy loam. The subsoil is about 33 inches thick. The upper 14 inches is brown loam, and the lower 19 inches is dark brown sandy loam. The part of the substratum between depths of 44 and 65 inches is brown very gravelly loamy sand.

Included with this soil in mapping are a few areas of Chagrin, Lobdell, and Potomac soils. Included soils make up about 20 percent of this map unit.

The available water capacity of the Tioga soil is moderate or high. Permeability is moderate or moderately rapid in the subsoil and moderate to rapid in the substratum. Runoff is medium. Natural fertility is high. This soil is moderately acid to neutral. The surface layer is friable and can be easily tilled. The depth to bedrock is more than 60 inches.

Most areas of this soil are used for cultivated crops or hay. Other areas are used for pasture or home gardens.

This soil is suited to cultivated crops. It is one of the best suited soils in the county for the production of the commonly grown crops. The crops can be damaged by the periodic flooding. Cultivated crops can be grown year after year, but a protective cover crop is needed. Including hay in the crop rotation, applying a system of conservation tillage, growing green manure crops, and returning crop residue to the soil can help to control erosion and maintain tilth.

This soil is suited to hay and pasture. Debris is deposited on the grassland during periods of flooding. A planned grazing system that includes rotational grazing, proper stocking rates, and cutting of hay at the proper stages of maturity help to control erosion and maintain the desirable species of plants.

The potential productivity of this soil for trees is moderately high. Few limitations affect woodland management, but the high natural fertility causes severe plant competition when cropland is converted to woodland. Red oak, yellow poplar, sugar maple, and black walnut are the dominant species.

The flooding is the main limitation on sites for dwellings. A soil that is better suited should be considered. Establishing a plant cover and controlling runoff help to prevent excessive erosion and stream scouring on construction sites.

The flooding is the main limitation on sites for local roads and streets. Constructing roads on raised fill material helps to overcome this limitation.

The flooding is a limitation on sites for septic tank absorption fields. In the areas of this soil that have a high content of sand and gravel in the subsoil or substratum, permeability may be too rapid for proper filtration of effluent before it enters the ground water. A soil that is better suited to these fields should be considered.

The capability subclass is IIw.

ToB—Toms silt loam, 3 to 8 percent slopes. This soil is very deep, gently sloping, and somewhat poorly drained. It is on foot slopes, in coves, along drainageways, and on benches in the eastern three-fourths of the county.

Typically, the surface layer is brown silt loam about 5 inches thick. The subsoil is about 41 inches thick. The upper 3 inches is yellowish brown silt loam mottled with grayish brown. The next 13 inches is yellowish brown silty clay loam and silty clay mottled with grayish brown, pale brown, and light brownish gray. The lower 25 inches of the subsoil is light gray channery silty clay and channery silty clay loam mottled with yellowish brown. The part of the substratum between depths of 46 and 65 inches is light gray very channery silty clay loam mottled with yellowish brown.

Included with this soil in mapping are a few areas of Clarksburg soils, a few areas of stony soils, a few areas where slopes are more than 8 percent, and a few areas of soils that have less clay in the subsoil than the Toms soil. Included soils make up about 20 percent of this map unit.

The available water capacity of the Toms soil is high, and permeability is slow. Runoff is medium. Natural fertility is high. This soil is moderately acid to mildly alkaline. The seasonal high water table is within about 0.5 foot of the surface during wet periods. The roots of some plants may be restricted by the water table. The depth to bedrock is more than 60 inches.

Most areas of this soil are used for pasture. Some areas have been drained and are used for hay or cultivated crops. A few areas are wooded.

This soil has limited suitability for cultivated crops. The wetness often delays spring planting. Drainage is difficult because of the slow permeability in the clayey subsoil. Erosion is a moderate hazard in unprotected areas. Delaying spring tillage until the soil is dry, including hay in the crop rotation, applying a system of conservation tillage, farming on the contour, growing cover crops and green manure crops, and returning crop residue to the soil can help to control erosion and maintain tilth.

This soil is suited to hay and pasture. It is better suited to grasses than legumes because of the seasonal high water table. Water tolerant species should be selected for planting. Unless this soil is drained, harvesting of hay often is restricted to the long, dry periods. Because the soil is soft when wet, grazing early in spring damages the sod. Erosion is a moderate hazard if the plant cover is removed by overgrazing. A planned grazing system that includes rotational grazing, proper stocking rates, deferment of spring grazing until the soil is firm, and cutting of hay at the proper stages of maturity help to control erosion and maintain the desirable species of plants.

The potential productivity of this soil for water tolerant trees is moderately high. Because the soil is soft when wet, the use of vehicular equipment is restricted during wet periods. Plant competition is severe when openings are made in the canopy, and seedling mortality is moderate. Erosion on logging roads and skid trails also is a management concern. It can be controlled by building the roads and trails on the contour. Pin oak, sugar maple, and northern red oak are the dominant species.

Wetness is the main limitation on sites for dwellings. Installing footer drains and waterproofing of walls help to keep the basements dry. A soil that is better suited to dwellings should be considered. Establishing a plant cover and controlling runoff help to prevent excessive erosion on construction sites.

The wetness, low strength, and potential frost action are limitations on sites for local roads and streets. Because this soil is soft when wet, the pavement cracks under heavy loads. Constructing the road on raised fill and installing a drainage system help to overcome the limitations.

The wetness and the slow permeability are limitations on sites for septic tank absorption fields. Alternative disposal systems or a soil that is better suited to these fields should be considered.

The capability subclass is IIIw.

TrC—Trussel channery loam, 3 to 15 percent slopes. This soil is very deep, strongly sloping or gently sloping, and poorly drained. It is in coves, along foot slopes, or along small drainageways on Allegheny and Spruce Mountains. This soil is at high elevations where the average annual precipitation is high and temperatures are cool.

Typically, the surface layer is about 3 inches thick. The upper 2 inches is very dark gray channery loam, and the lower 1 inch is grayish brown channery silt loam. The subsoil is about 37 inches thick. The upper 4 inches of the subsoil is light brownish gray channery silty clay loam mottled with strong brown. The next 5 inches is strong brown channery silt loam mottled with light brownish gray. The next 9 inches is grayish brown, firm and slightly brittle, channery silt loam mottled with yellowish brown and black. The lower 19 inches is yellowish brown channery loam mottled with light brownish gray and black. The part of the substratum between depths of 40 and 65 inches is yellowish brown channery loam and channery silt loam mottled with light brownish gray and dark gray.

Included with this soil in mapping are a few areas of Simoda soils, a few areas of soils that have more clay in the subsoil than the Trussel soil, and a few areas of stony and rubbly soils. Also included are a few areas of nearly level soils, a few areas of less acid soils, and several areas that have more sand in the subsoil than the Trussel soil. Included soils make up about 30 percent of this map unit.

The Trussel soil has a moderate available water capacity. It has a fragipan. Permeability is slow or moderately slow in the fragipan. Natural fertility is low. This soil is extremely acid to strongly acid. The seasonal high water table is at or near the surface during wet periods. The roots of some plants may be restricted by the fragipan and the water table. The depth to bedrock is more than 60 inches.

Most areas of this soil are used for summer pasture. Some brushy areas, which locally are called sods, support mountain laurel, huckleberry, azalea, and native grasses or sedges.

This soil is not suited to the commonly grown cultivated crops because of a short growing season. The wetness also is a limitation. Because most of this unit is in the Monongahela National Forest, it generally is not used for cultivated crops.

This soil is suited to hay and pasture, but suitable species are limited to those that can tolerate the short growing season and the wetness. Most areas are used for summer pasture. The soil is better suited to grasses than legumes because of the wetness. Erosion is a moderate or severe hazard if the plant cover is removed by overgrazing. A planned grazing system that includes rotational grazing, proper stocking rates, brush management, and cutting of hay at the proper stages of maturity help to control erosion and maintain tilth.

The potential productivity of this soil for red spruce trees is very high. Because the soil is soft when wet, the use of vehicular equipment is restricted during wet periods. Plant competition is severe when openings are made in the canopy, and seedling mortality is high. Erosion on logging roads and skid trails also is a management concern. It can be controlled by building the roads and trails on the contour. Red spruce, red maple, black cherry, and yellow birch are the dominant species.

The wetness is the main limitation on sites for dwellings. A soil that is better suited should be considered. Because most of this unit is in the Monongahela National Forest, it seldom is used as a site for dwellings.

The wetness and potential frost action are limitations on sites for local roads and streets. Because the soil is soft when wet, the pavements crack under heavy loads. Constructing roads on raised fill material and installing a drainage system help to overcome the limitations.

The wetness and the moderately slow or slow permeability are limitations on sites for septic tank absorption fields. Alternative disposal systems or a soil that is better suited to these fields should be considered. Because most of this unit is in the Monongahela National Forest, it seldom is used as a site for septic tank absorption fields.

The capability subclass is IIIe.

TsC—Trussel channery loam, 3 to 15 percent slopes, extremely stony. This soil is very deep, strongly sloping or gently sloping, and poorly drained. It is in coves, along foot slopes, or along small drainageways on Allegheny Mountain and Spruce Mountain. Stones and boulders cover 15 to 50 percent of the surface. This soil is at high elevations where the average annual precipitation is high and temperatures are cool.

Typically, the surface layer is about 5 inches thick. The upper 2 inches is very dark gray channery loam, and the lower 3 inches is grayish brown channery silt loam. The subsoil is about 35 inches thick. The upper 4 inches is light brownish gray channery silty clay loam mottled with strong brown. The next 5 inches is strong brown channery silt loam mottled with light brownish gray. The next 9 inches is grayish brown, firm and slightly brittle, channery silt loam mottled with yellowish brown and black. The lower 19 inches is yellowish brown channery loam mottled with light brownish gray and black. The part of the substratum between depths of 40 and 65 inches is yellowish brown channery loam and channery silt loam mottled with light brownish gray and dark gray.

Included with this soil in mapping are a few areas of Simoda soils and several areas of rubbly soils. Also included are several areas that have more sand in the profile than the Trussel soil, and some areas where slopes are more than 15 percent. Included soils make up about 30 percent of this map unit.

The Trussel soil has a moderate available water capacity. It has a fragipan. Permeability is slow or moderately slow in the fragipan. Natural fertility is low. This soil is extremely acid to strongly acid. The seasonal high water table is at or near the surface during wet periods. The roots of some plants may be restricted by the fragipan or the water table. The depth to bedrock is more than 60 inches.

Most areas of this soil support brushy woodland or native grasses and sedges with scattered woody species. Most of the unit is in remote areas of the Monongahela National Forest and is used for recreation and botanical study.

This soil is not suited to cultivated crops, hay, or pasture. The stones and boulders prevent the operation of conventional farm equipment. Because of the altitude, the growing season is short. This limits the production of the commonly grown crops.

The potential productivity of this soil for red spruce trees is high. The wetness restricts the use of vehicular equipment during winter and spring. Plant competition is severe when openings are made in the canopy. The stones and boulders interfere with the use of logging equipment and with the planting of seedlings after logging. The rate of seedling mortality is high. Erosion on logging roads and skid trails also is a management concern. It can be controlled by building the roads and trails on the contour. Red spruce, red maple, black cherry, and yellow birch are the dominant species. The height of these trees often is restricted by the strong westerly winds and the harsh climate. Limbs generally are concentrated on the east-facing side of the trees, and the west-facing side is nearly bare. The undergrowth commonly is brushy and dense and almost impenetrable.

The wetness is a limitation on sites for dwellings, especially for dwellings with basements. The stones and boulders interfere with the establishment of lawns and with landscaping. Because most of this unit is in remote areas, it seldom is used as a site for dwellings.

The wetness and potential frost action are limitations on sites for local roads and streets. The stones also are a limitation. Because the soil is soft when wet, the pavements crack under heavy loads. Constructing roads on raised fill material and installing a drainage system help to overcome the wetness and frost action.

The wetness and the moderately slow or slow permeability are limitations on sites for septic tank absorption fields. A soil that is better suited should be considered. Because most of the unit is in remote areas, it seldom is used as a site for septic tank absorption fields.

The capability subclass is VIIs.

TyB—Tygart silt loam, 3 to 8 percent slopes. This soil is very deep, gently sloping, and somewhat poorly drained. It is in river valleys on concave stream terraces at elevations above the flood plains.

Typically, the surface layer is brown silt loam about 9 inches thick. The subsoil is about 30 inches thick. The upper 5 inches is brown silty clay loam mottled with light brownish gray, strong brown, and red. The next 18 inches is brown and light brownish gray silty clay mottled with strong brown and red. The lower 7 inches is gray silty clay loam mottled with strong brown, yellowish red, and red. The part of the substratum between depths of 39 and 46 inches is light gray silty clay mottled with strong brown. The part between depths of 46 and 55 inches is dark gray and very dark gray silty clay. The lower part is dark gray and very dark gray gravelly silty clay. It extends to a depth of 65 inches or more.

Included with this soil in mapping are a few areas of Monongahela and Purdy soils. Also included are small areas that are less clayey in the upper part of the subsoil than the Tygart soil, areas that have a gravelly subsoil, and areas where slopes are less than 3 or more than 8 percent. Included soils make up about 30 percent of this map unit.

The available water capacity of the Tygart soil is moderate or high, and permeability is slow. Runoff is medium. Natural fertility is low. This soil generally is strongly acid or very strongly acid. Many areas have been limed. The surface layer in these areas is slightly acid or neutral. The seasonal seasonal high water table is within 0.5 to 1.5 feet of the surface during wet periods. The roots of some plants may be restricted by the water table. The depth to bedrock is more than 60 inches.

Most areas of this soil are used for pasture. Some areas have been drained and are used for hay or cultivated crops. A few areas are wooded.

This soil has limited suitability for cultivated crops. The wetness often delays spring planting. Drainage is difficult because of the slow permeability in the clayey subsoil. Erosion is a moderate hazard in unprotected areas. Delaying spring tillage until the soil is dry, including hay in the crop rotation, applying a system of conservation tillage, farming on the contour, growing cover crops and green manure crops, and returning crop residue to the soil help to control erosion and maintain tilth.

This soil is suited to hay and pasture. It is better suited to grasses than legumes because of the seasonal high water table. Water tolerant species should be selected for planting. Unless the soil is drained, harvesting of hay often is restricted to the long, dry periods. Because the soil is soft when wet, grazing early in spring damages the sod. Erosion is a moderate hazard if the plant cover is removed by overgrazing. A planned grazing system that includes rotational grazing, proper stocking rates, deferment of spring grazing until the soil is firm, and cutting of hay at the proper stages of maturity help to control erosion and maintain the desirable species of plants.

The potential productivity of this soil for water tolerant trees is moderately high. Because the soil is soft when wet, the use of vehicular equipment is restricted during wet periods. Plant competition is severe when openings are made in the canopy, and seedling mortality is high. Erosion on logging roads and skid trails also is a management concern. It can be controlled by building the roads and trails on the contour. Northern red oak, red maple, and black oak are the dominant species.

The wetness is the main limitation on sites for dwellings. Installing footer drains and waterproofing of walls helps to keep basements dry. A soil that is better suited to dwellings should be considered. Establishing a plant cover and controlling runoff help to prevent excessive erosion on construction sites.

The wetness and low strength are limitations on sites for local roads and streets. Because this soil is soft when wet, the pavement cracks under heavy loads. Constructing the road on raised fill and installing a drainage system help to overcome the limitations.

The wetness and slow permeability are limitations on sites for septic tank absorption fields. Alternative disposal systems or a soil that is better suited to these fields should be considered.

The capability subclass is IIIw.

Ud—Udorthents, smoothed. These nearly level to very steep areas consist of mixed soil material and rock fragments deposited as a result of excavation, grading, and filling. Much of this material was deposited during the construction of flood control dams. Other areas were formed during the construction of large poultry houses, lumber mills, and roads.

This unit commonly consists of yellowish brown, channery to extremely channery soil material. The soils are very shallow to very deep. Most areas of this unit are well drained, but some areas are wet. Most of the material is loamy, but some is clayey. The clayey material was used as borrow material during construction of dams. This unit is mostly strongly acid or very strongly acid. Natural fertility is low.

This unit generally is not suited to cultivated crops, hay, or pasture. Onsite investigation is needed to determine the suitability of the unit for woodland, sanitary facilities, building site development, and other uses.

This unit is not assigned to a capability subclass.

Prime Farmland

Prime farmland is one of several kinds of important farmland defined by the U.S. Department of Agriculture. It is of major importance in meeting the Nation's short- and long-range needs for food and fiber. Because the supply of high quality farmland is limited, the U.S. Department of Agriculture recognizes that responsible levels of government, as well as individuals, should encourage and facilitate the wise use of our Nation's prime farmland.

Prime farmland, as defined by the U.S. Department of Agriculture, is the land that is best suited to food, feed, forage, fiber, and oilseed crops. It may be cultivated land, pasture, woodland, or other land, but it is not urban and built-up land or water areas. It either is used for food or fiber crops or is available for those crops. The soil qualities, growing season, and moisture

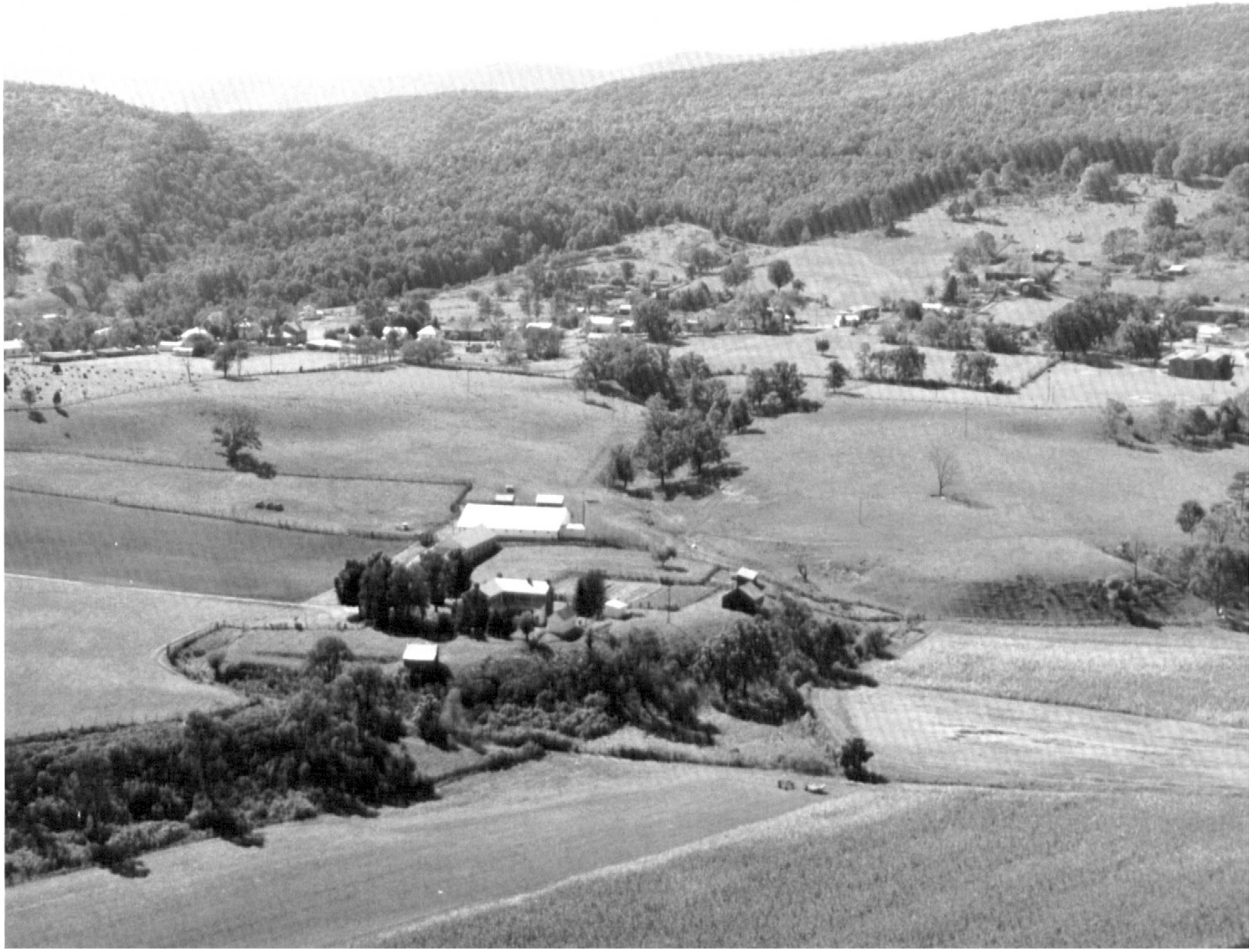

Figure 8.—Typical areas of Tioga loam and Lobdell loam, which are considered prime farmland.

supply are those needed for a well managed soil to produce a sustained high yield of crops in an economic manner. Prime farmland produces the highest yields with minimal inputs of energy and economic resources, and farming it results in the least damage to the environment.

Prime farmland has an adequate and dependable supply of moisture from precipitation or irrigation. The temperature and growing season are favorable. The level of acidity or alkalinity is acceptable. Prime farmland has few or no rocks and is permeable to water and air. It is not excessively erodible or saturated with water for long periods and is not frequently flooded during the growing season. The slope ranges mainly from 0 to 8 percent. More detailed information about the criteria for prime farmland is available at the local office of the Soil Conservation Service.

About 6,170 acres, or about 1 percent, of the survey area meets the soil requirements for prime farmland. It is mainly along the stream valleys (fig. 8).

The map units in the survey area that are considered prime farmland are listed in table 5. This list does not constitute a recommendation for a particular land use. The extent of each listed map unit is shown in table 4. The location is shown on the detailed soil maps at the back of this publication. The soil qualities that affect use and management are described under the heading "Detailed Soil Map Units."

Some soils not listed in table 5 would be classified as prime farmland if certain limitations were overcome. For example, Dunning silt loam, Orrville loam, and Purdy silt loam would be considered prime farmland if they were adequately drained.

Use and Management of the Soils

This soil survey is an inventory and evaluation of the soils in the survey area. It can be used to adjust land uses to the limitations and potentials of natural resources and the environment. Also, it can help avoid soil-related failures in land uses.

In preparing a soil survey, soil scientists, conservationists, engineers, and others collect extensive field data about the nature and behavior characteristics of the soils. They collect data on erosion, droughtiness, flooding, and other factors that affect various soil uses and management. Field experience and collected data on soil properties and performance are used as a basis in predicting soil behavior.

Information in this section can be used to plan the use and management of soils for crops and pasture; as woodland; as sites for buildings, sanitary facilities, highways and other transportation systems, and parks and other recreation facilities; and for wildlife habitat. It can be used to identify the potentials and limitations of each soil for specific land uses and to help prevent construction failures caused by unfavorable soil properties.

Planners and others using soil survey information can evaluate the effect of specific land uses on productivity and on the environment in all or part of the survey area. The survey can help planners to maintain or create a land use pattern in harmony with the natural soil.

Contractors can use this survey to locate sources of sand and gravel, roadfill, and topsoil. They can use it to identify areas where bedrock, wetness, or very firm soil layers can cause difficulty in excavation.

Health officials, highway officials, engineers, and others may also find this survey useful. The survey can help them plan the safe disposal of wastes and locate sites for pavements, sidewalks, campgrounds, playgrounds, lawns, and trees and shrubs.

Crops and Pasture

Dixie L. Shreve, resource conservationist, Soil Conservation Service, helped to prepare this section.

General management needed for crops and pasture is suggested in this section. The crops or pasture plants best suited to the soils are identified, the system of land capability classification used by the Soil Conservation Service is explained, and the estimated yields of the main crops and hay and pasture plants are listed for each soil.

Planners of management systems for individual fields or farms should consider the detailed information given in the description of each soil under "Detailed Soil Map Units." Specific information can be obtained from the local office of the Soil Conservation Service or the Cooperative Extension Service.

Most of the soils in the survey area have a low or moderate content of the basic nutrients needed for plant growth; therefore, the soils respond well to applications of lime, phosphorus, potassium, and nitrogen. The amounts of lime and fertilizer needed depend on the types of soils, the cropping history, the kinds of crops to be grown, and the desired yields. Laboratory analysis of the soils can help to determine specific needs.

The organic matter content is low in most of the soils in the survey area. It is important, therefore, to maintain or increase the organic matter content by adding manure, returning crop residue to the soil, and growing sod crops, cover crops, and green manure crops.

Runoff from areas of cropland on sloping soils and from overgrazed pastures causes excessive erosion. The hazard of erosion is most severe in areas of the shaly Berks and Weikert soils and the clayey Opequon and Caneyville soils during periods of intense rainfall. Management practices that reduce erosion in the areas of cropland include rotating crops, minimizing tillage, using crop residue, growing cover crops, farming on the contour, and constructing diversion ditches and grassed waterways. Management practices that help to control erosion on pastures include proper stocking rates, applying fertilizer, selecting proper seed mixtures, and rotational grazing.

Periodic flooding causes severe streambank erosion of the fertile bottom land soils. Practices that help to stabilize these soils include using riprap or establishing a plant cover along the banks of the streams.

The periodic droughts in summer are a major concern in producing crops and pasture in this survey area. Although irrigation would increase crop yields, it is not used extensively in the area. Only a few farmers who have access to large volumes of water use irrigation systems. The high cost of developing these systems makes widespread use infeasible. More information on the droughts in the area is given in the section "General Nature of the County."

Yields Per Acre

The average yields per acre that can be expected of the principal crops under a high level of management are shown in table 6. In any given year, yields may be higher or lower than those indicated in the table because of variations in rainfall and other climatic factors. The land capability classification of each map unit also is shown in the table.

The yields are based mainly on the experience and records of farmers, conservationists, and extension agents. Available yield data from nearby counties and results of field trials and demonstrations are also considered.

The management needed to obtain the indicated yields of the various crops depends on the kind of soil and the crop. Management can include drainage, erosion control, and protection from flooding; the proper planting and seeding rates; suitable high-yielding crop varieties; appropriate and timely tillage; control of weeds, plant diseases, and harmful insects; favorable soil reaction and optimum levels of nitrogen, phosphorus, potassium, and trace elements for each crop; effective use of crop residue, barnyard manure, and green manure crops; and harvesting that ensures the smallest possible loss.

The estimated yields reflect the productive capacity of each soil for each of the principal crops. Yields are likely to increase as new production technology is developed. The productivity of a given soil compared with that of other soils, however, is not likely to change.

Crops other than those shown in table 6 are grown in the survey area, but estimated yields are not listed because the acreage of such crops is small. The local office of the Soil Conservation Service or of the Cooperative Extension Service can provide information about the management and productivity of the soils for those crops.

Land Capability Classification

Land capability classification shows, in a general way, the suitability of soils for most kinds of field crops. Crops that require special management are excluded. The soils are grouped according to their limitations for field crops, the risk of damage if they are used for crops, and the way they respond to management. The criteria used in grouping the soils do not include major and generally expensive landforming that would change slope, depth, or other characteristics of the soils, nor do they include possible but unlikely major reclamation projects. Capability classification is not a substitute for interpretations designed to show suitability and limitations of groups of soils for rangeland, for woodland, and for engineering purposes.

In the capability system, soils are generally grouped at three levels: capability class, subclass, and unit. Only class and subclass are used in this survey. These levels are defined in the following paragraphs.

Capability classes, the broadest groups, are designated by Roman numerals I through VIII. The numerals indicate progressively greater limitations and narrower choices for practical use. The classes are defined as follows:

Class I soils have few limitations that restrict their use.

Class II soils have moderate limitations that reduce the choice of plants or that require moderate conservation practices.

Class III soils have severe limitations that reduce the choice of plants or that require special conservation practices, or both.

Class IV soils have very severe limitations that reduce the choice of plants or that require very careful management, or both.

Class V soils are not likely to erode but have other limitations, impractical to remove, that limit their use.

Class VI soils have severe limitations that make them generally unsuitable for cultivation.

Class VII soils have very severe limitations that make them unsuitable for cultivation.

Class VIII soils and miscellaneous areas have limitations that nearly preclude their use for commercial crop production.

Capability subclasses are soil groups within one class. They are designated by adding a small letter, *e, w, s,* or *c,* to the class numeral, for example, IIe. The letter *e* shows that the main limitation is risk of erosion unless close-growing plant cover is maintained; *w* shows that water in or on the soil interferes with plant growth or cultivation (in some soils the wetness can be partly corrected by artificial drainage); *s* shows that the soil is limited mainly because it is shallow, droughty, or stony; and *c*, used in only some parts of the United States, shows that the chief limitation is climate that is very cold or very dry.

In class I there are no subclasses because the soils of this class have few limitations. Class V contains only the subclasses indicated by *w, s,* or *c* because the soils in class V are subject to little or no erosion. They have other limitations that restrict their use to pasture, rangeland, woodland, wildlife habitat, or recreation.

The acreage of the soils in each capability class and subclass is shown in table 7. The capability classification of each map unit is given in the section "Detailed Soil Map Units" and in table 6.

Woodland Management and Productivity

About 335,400 acres, or 75 percent, of the survey area is wooded. Most of this acreage is privately owned, and only 34,200 acres is noncommercial forest land *(4)*. Areas of woodland range from small farm woodlots to large corporate tracts. The United States Department of Agriculture, Forest Service, manages several thousand acres of forest land in the survey area.

The most common forest types, or natural associations of tree species, are the oak-hickory type, which makes up about 59 percent of the wooded acreage, and the maple-beech-birch type, which makes up about 9 percent. Other hardwood types make up about 21 percent of the acreage and pine types about 11 percent.

Most of the maple-beech-birch type is on the Allegheny Plateau and on Spruce Mountain, in the western part of the county. Stands of native red spruce also are in these areas at the higher elevations. The other forest types are scattered throughout the rest of the county. Areas of the pine type in the central and eastern parts of the county are mainly on southern and western exposures or in areas of soils that are shallow over bedrock.

This survey area supports a sizeable pulpwood industry. Most of the pulpwood is marketed at the paper plants at Covington, Virginia, and Luke, Maryland. Small plantations of commercial Christmas trees also are common in the county.

Soil properties have a strong influence on tree species, tree growth, and woodland management. The soil depth and texture, for example, affect the available water capacity, which influences the occurrence of a species and the rate of growth. Other features, such as slope, stoniness or rockiness, or the presence of a clayey subsoil, influence the kinds of management needed. Aspect, or the direction a sloping soil faces, also affects tree growth and management.

In much of the Valley and Ridge Physiographic Province, very large acreages of soils that have a low or very low available water capacity and receive only small amounts of rainfall limit the potential productivity for tree crops.

Table 8 can be used by woodland owners or forest managers in planning the use of soils for wood crops. Only those soils suitable for wood crops are listed.

Because of the variability between soils on south aspects versus those on north aspects, dual entries are given for the ordination symbol, the site index, the productivity class, and the seedling mortality rate of some soils. South aspects are those that face the compass directions from 135 to 315 degrees, and north aspects are those that face from 315 to 135 degrees. Aspect affects the potential productivity of sloping soils. The soils on north aspects generally are more moist and have a higher site index than those on south aspects. Aspect also affects the occurrence of a tree species, the seedling mortality rate, and the management practices needed.

The table lists the ordination symbol for each suitable soil. Soils assigned the same ordination symbol require the same general management and have about the same potential productivity.

The first part of the *ordination symbol*, a number, indicates the potential productivity of the soils for an indicator tree species. The number indicates the volume, in cubic meters per hectare per year, which the indicator species can produce. The number 1 indicates low potential productivity; 2 and 3, moderate; 4 and 5, moderately high; 6 to 8, high; 9 to 11, very high; and 12 or more, extremely high. The second part of the symbol, a letter, indicates the major kind of soil limitation. The letter *R* indicates steep slopes; *X*, stoniness or rockiness; *W*, excess water in or on the soil; *T*, toxic substances in the soil; *D*, restricted rooting depth; *C*, clay in the upper part of the soil; *S*, sandy texture; and *F*, a high content of rock fragments in the soil. The letter *A* indicates that limitations or restrictions are insignificant (fig. 9). If a soil has more than one limitation, the priority is as follows: R, X, W, T, D, C, S, and F.

In table 8, *slight, moderate,* and *severe* indicate the degree of the major soil limitations to be considered in management.

Erosion hazard is the probability that damage will occur as a result of site preparation and cutting where the soil is exposed along roads, skid trails, fire lanes, and log-handling areas. Forests that have been burned or overgrazed are also subject to erosion. Ratings of the erosion hazard are based on the percent of the slope and the erosion factor K, which is shown in table 16. A rating of *slight* indicates that no particular prevention measures are needed under ordinary conditions. A rating of *moderate* indicates that erosion-control measures are needed in certain silvicultural activities. A rating of *severe* indicates that special precautions are needed to control erosion in most silvicultural activities.

Proper construction and maintenance of roads, trails, landings, and fire lanes help to overcome the hazard of erosion.

Equipment limitation reflects the characteristics and

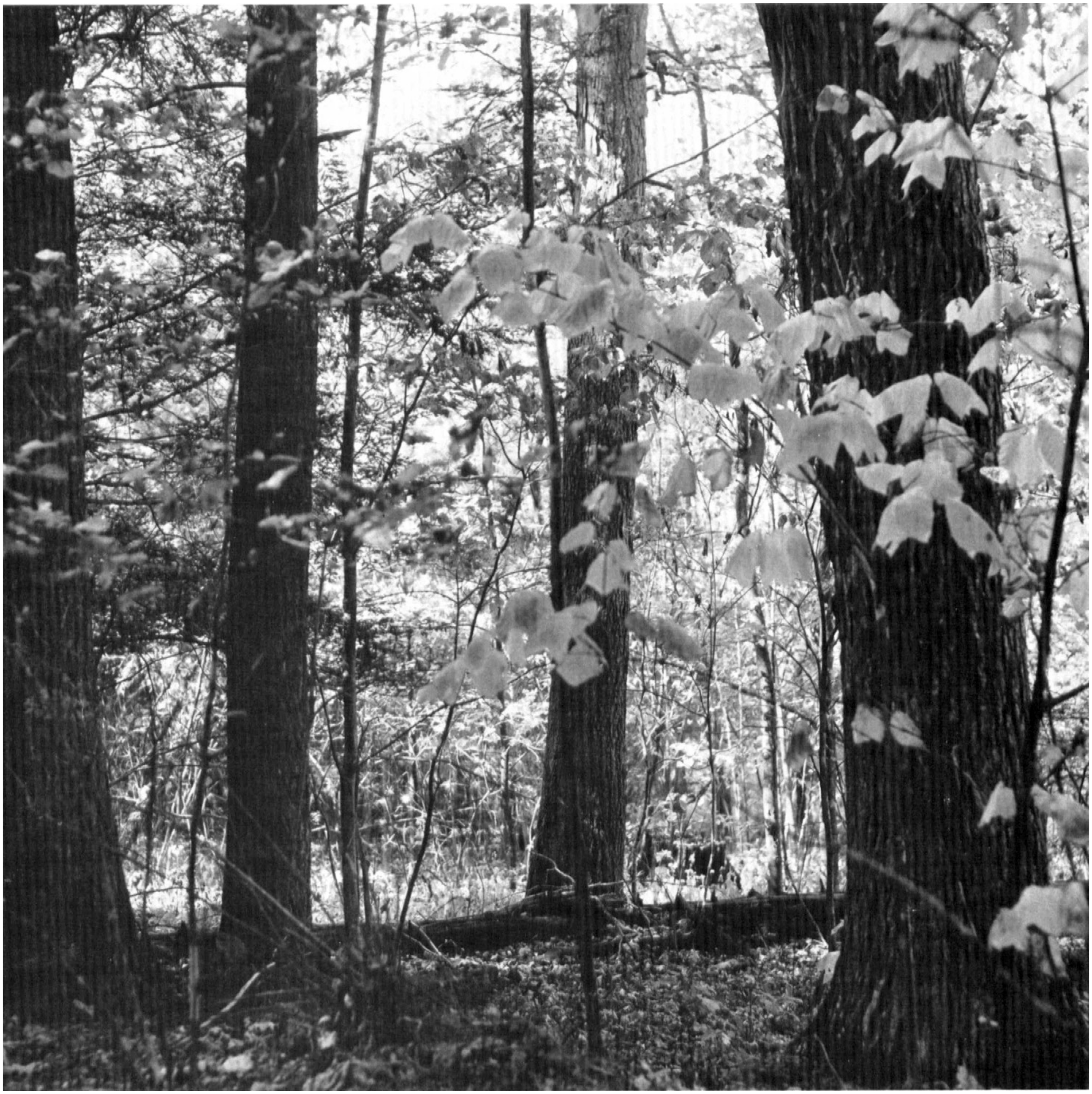

Figure 9.—Area of Shouns channery loam, 3 to 15 percent slopes, stony. This soil has moderately high potential for production of trees. The woodland suitability group is 4A.

conditions of the soil that restrict use of the equipment generally needed in woodland management or harvesting. The chief characteristics and conditions considered in the ratings are slope, stones on the surface, rock outcrops, soil wetness, and texture of the surface layer. A rating of *slight* indicates that under normal conditions the kind of equipment or season of use is not significantly restricted by soil factors. Soil wetness can restrict equipment use, but the wet period does not exceed 1 month. A rating of *moderate* indicates that equipment use is moderately restricted because of one or more soil factors. If the soil is wet, the wetness restricts equipment use for a period of 1 to 3 months. A rating of *severe* indicates that equipment use is severely restricted either as to the kind of equipment that can be used or the season of use. If the soil is wet, the wetness restricts equipment use for more than 3 months.

Selecting the most suitable equipment and properly timing harvesting and other operations to avoid seasonal restrictions help to overcome the equipment limitations.

Seedling mortality refers to the death of naturally occurring or planted tree seedlings, as influenced by the kinds of soil, soil wetness, or topographic conditions. The factors used in rating the soils for seedling mortality are texture of the surface layer, depth to a seasonal high water table and the length of the period when the water table is high, rock fragments in the surface layer, effective rooting depth, and slope aspect. A rating of *slight* indicates that seedling mortality is not likely to be a problem under normal conditions. Expected mortality is less than 25 percent. A rating of *moderate* indicates that some problems from seedling mortality can be expected. Extra precautions are advisable. Expected mortality is 25 to 50 percent. A rating of *severe* indicates that seedling mortality is a serious problem. Extra precautions are important. Replanting may be necessary. Expected mortality is more than 50 percent.

The use of special planting stock and proper site preparation, such as bedding, furrowing, or surface drainage, help to reduce the seedling mortality rate.

Plant competition ratings indicate the degree to which undesirable species are expected to invade and grow when openings are made in the tree canopy. The main factors that affect plant competition are the depth to the water table and the available water capacity. A rating of *slight* indicates that competition from undesirable plants is not likely to prevent natural regeneration or suppress the more desirable species. Planted seedlings can become established without undue competition. A rating of *moderate* indicates that competition may delay the establishment of desirable species. Competition may hamper stand development, but it will not prevent the eventual development of fully stocked stands. A rating of *severe* indicates that competition can be expected to prevent regeneration unless precautionary measures are applied.

Adequate site preparation before planting seedlings helps to reduce plant competition.

The *potential productivity* of merchantable or *common trees* on a soil is expressed as a *site index*. This index is the average height, in feet, that dominant and codominant trees of a given species attain in 50 years. The site index applies to fully stocked, even-aged, unmanaged stands. Commonly grown trees are those that woodland managers generally favor in intermediate or improvement cuttings. They are selected on the basis of growth rate, quality, value, and marketability. Also listed are species, regardless of their value or growth rate, that commonly grow on the soils.

The *productivity class*, a number, is the yield likely to be produced by the most important trees. This number, expressed as cubic meters per hectare per year, indicates the amount of fiber produced on a fully stocked, even-aged, unmanaged stand. One cubic meter per hectare equals 14.3 cubic feet per acre.

The first species listed under *common trees* for a soil is the indicator species for that soil. It is the dominant species on the soil and the one that determines the ordination class. It generally is the most productive species on the soil.

Trees to plant are those that are suited to the soils. They are planted for commercial wood production or for conservation purposes.

Recreation

Pendleton County has numerous areas that are used for camping, hiking, rock climbing, hunting, fishing, sightseeing, spelunking, canoeing, and boating. Lands available for recreational activities include the Monongahela National Forest, the George Washington National Forest, and several privately owned areas.

The Monongahela National Forest lies mainly in the western half of the county, and it includes Spruce Knob, which is the highest point in West Virginia. Also in this area are the Spruce Knob-Seneca Rocks National Recreation Area, the Smoke Hole National Recreation Area, the Seneca Creek Pioneer Area, and the Seneca Rocks Visitor Center. Germany Valley, also in the western half of the county, is noted for its scenic beauty and many caves. There is one commercial cave in the county that is open to the public, and there are about 60 other significant caves *(7)*.

The George Washington National Forest lies along the eastern edge of the county. This area has several scenic sites, one of which is Reddish Knob. The Brandywine Recreation Area also is located in this part of the county (fig. 10). It has a 10-acre lake and facilities for camping, hiking, swimming, and picnicking *(9)*. In addition, private campgrounds are located throughout the county.

The soils of the survey area are rated in table 9

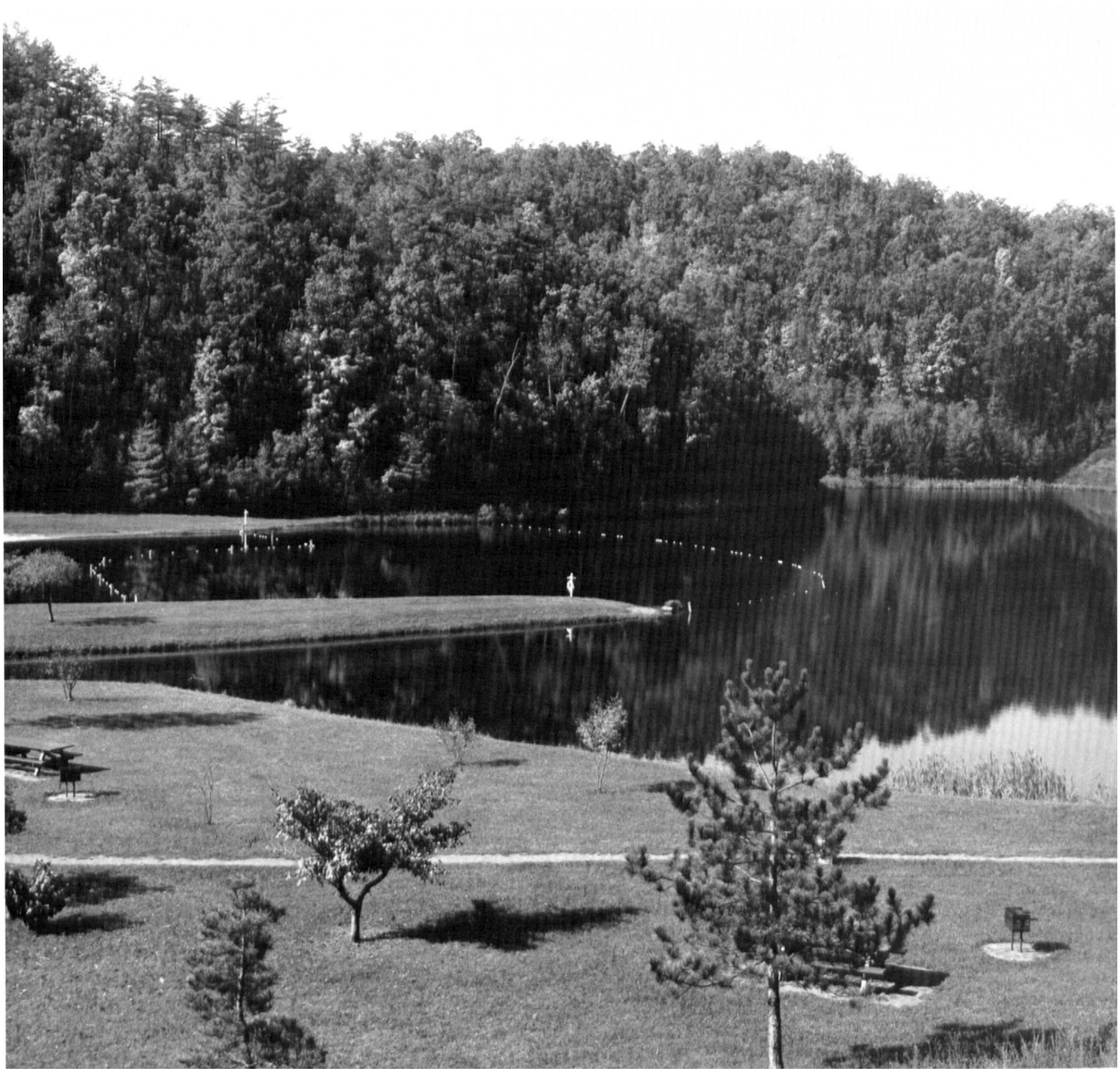

Figure 10.—Recreation is a secondary use of the area affected by the flood control dam near Brandywine. The wooded areas are Berks-Weikert channery silt loams, 25 to 55 percent slopes, and the cleared areas are Udorthents, smoothed.

according to limitations that affect their suitability for recreation. The ratings are based on restrictive soil features, such as wetness, slope, and texture of the surface layer. Susceptibility to flooding is considered. Not considered in the ratings, but important in evaluating a site, are the location and accessibility of the area, the size and shape of the area and its scenic quality, vegetation, access to water, potential water impoundment sites, and access to public sewer lines. The capacity of the soil to absorb septic tank effluent and the ability of the soil to support vegetation are also important. Soils subject to flooding are limited for recreation use by the duration and intensity of flooding and the season when flooding occurs. In planning recreation facilities, onsite assessment of the height, duration, intensity, and frequency of flooding is essential.

In table 9, the degree of soil limitation is expressed as slight, moderate, or severe. *Slight* means that soil properties are generally favorable and that limitations are minor and easily overcome. *Moderate* means that limitations can be overcome or alleviated by planning, design, or special maintenance. *Severe* means that soil properties are unfavorable and that limitations can be offset only by costly soil reclamation, special design, intensive maintenance, limited use, or by a combination of these measures.

The information in table 9 can be supplemented by other information in this survey, for example, interpretations for septic tank absorption fields in table 12 and interpretations for dwellings without basements and for local roads and streets in table 11.

Camp areas require site preparation, such as shaping and leveling the tent and parking areas, stabilizing roads and intensively used areas, and installing sanitary facilities and utility lines. Camp areas are subject to heavy foot traffic and some vehicular traffic. The best soils have mild slopes and are not wet or subject to flooding during the period of use. The surface has few or no stones or boulders, absorbs rainfall readily but remains firm, and is not dusty when dry. Strong slopes and stones or boulders can greatly increase the cost of constructing campsites.

Picnic areas are subject to heavy foot traffic. Most vehicular traffic is confined to access roads and parking areas. The best soils for picnic areas are firm when wet, are not dusty when dry, are not subject to flooding during the period of use, and do not have slopes or stones or boulders that increase the cost of shaping sites or of building access roads and parking areas.

Playgrounds require soils that can withstand intensive foot traffic. The best soils are almost level and are not wet or subject to flooding during the season of use. The surface is free of stones and boulders, is firm after rains, and is not dusty when dry. If grading is needed, the depth of the soil over bedrock or a hardpan should be considered.

Paths and trails for hiking and horseback riding should require little or no cutting and filling. The best soils are not wet, are firm after rains, are not dusty when dry, and are not subject to flooding more than once a year during the period of use. They have moderate slopes and few or no stones or boulders on the surface.

Golf fairways are subject to heavy foot traffic and some light vehicular traffic. Cutting or filling may be required. The best soils for use as golf fairways are firm when wet, are not dusty when dry, and are not subject to prolonged flooding during the period of use. They have moderate slopes and no stones or boulders on the surface. The suitability of the soil for tees or greens is not considered in rating the soils.

Wildlife Habitat

Gary A. Gwinn, biologist, Soil Conservation Service, helped to prepare this section.

Pendleton County supports large populations of native wildlife species because of the favorable land use patterns and suitable climatic conditions. Large tracts of woodland, consisting of uneven-aged stands of the oak-hickory-pine forest type and northern hardwoods type, provide the habitat elements for large numbers of white-tailed deer, wild turkey, ruffed grouse, squirrels, and black bear. The transitional areas between the woodland and farmland support medium to large populations of cottontail rabbit and groundhogs and a few bobwhite quail. Soils on the flood plains and in areas near the streams support huntable populations of mourning dove, woodcock, and ducks. Beaver and snowshoe hare primarily inhabit the higher elevations of the Allegheny and Spruce Mountains, in the western part of the county. The streams, lakes, and farm ponds provide habitat for a variety of fish, including smallmouth bass and trout (fig. 11).

Soils affect the kind and amount of vegetation that is available to wildlife as food and cover. They also affect the construction of water impoundments. The kind and abundance of wildlife depend largely on the amount and distribution of food, cover, and water. Wildlife habitat can be created or improved by planting appropriate vegetation, by maintaining the existing plant cover, or by promoting the natural establishment of desirable plants.

In table 10, the soils in the survey area are rated according to their potential for providing habitat for various kinds of wildlife. This information can be used in planning parks, wildlife refuges, nature study areas, and other developments for wildlife; in selecting soils that are suitable for establishing, improving, or maintaining specific elements of wildlife habitat; and in determining the intensity of management needed for each element of the habitat.

The potential of the soil is rated good, fair, poor, or very poor. A rating of *good* indicates that the element or kind of habitat is easily established, improved, or maintained. Few or no limitations affect management, and satisfactory results can be expected. A rating of *fair*

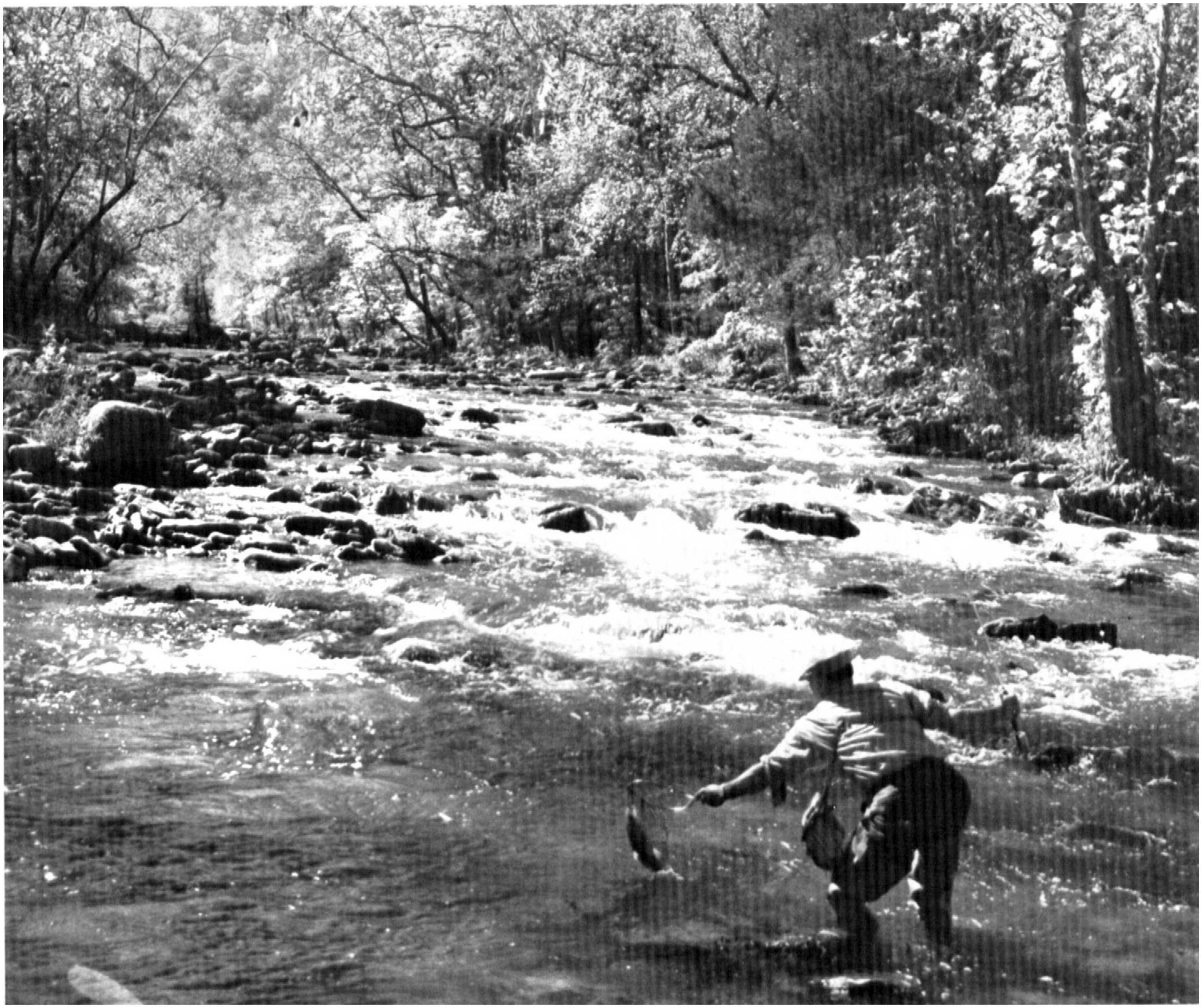

Figure 11.—The South Branch of the Potomac River, shown flowing through an area of Potomac very cobbly fine sandy loam, provides habitat for a variety of fish, including trout.

indicates that the element or kind of habitat can be established, improved, or maintained in most places. Moderately intensive management is required for satisfactory results. A rating of *poor* indicates that limitations are severe for the designated element or kind of habitat. Habitat can be created, improved, or maintained in most places, but management is difficult and must be intensive. A rating of *very poor* indicates that restrictions for the element or kind of habitat are very severe and that unsatisfactory results can be expected. Establishing, improving, or maintaining habitat is impractical or impossible or requires long periods of time.

When interpreting the data in table 10, it is important to note that entries in the table reflect only the ability of the individual soils to produce wildlife habitat. In a specific ecosystem, several different soils may combine to produce abundant wildlife habitat even though the potential of the individual soils in that ecosystem for producing habitat is rated as poor or very poor. Also, droughty, moderately deep soils, such as those of the

Berks series, may be rated as poor for potential production of woodland wildlife habitat because of the slow growth rate of the hardwood trees. In time, however, the hardwood trees planted on these soils may mature and produce the elements needed to support large populations of woodland wildlife.

The elements of wildlife habitat are described in the following paragraphs.

Grain and seed crops are domestic grains and seed-producing herbaceous plants. Soil properties and features that affect the growth of grain and seed crops are depth of the root zone, texture of the surface layer, available water capacity, wetness, slope, surface stoniness, and flood hazard. Soil temperature and soil moisture are also considerations. Examples of grain and seed crops are corn, wheat, oats, and barley.

Grasses and legumes are domestic perennial grasses and herbaceous legumes. Soil properties and features that affect the growth of grasses and legumes are depth of the root zone, texture of the surface layer, available water capacity, wetness, surface stoniness, flood hazard, and slope. Soil temperature and soil moisture are also considerations. Examples of grasses and legumes are fescue, bluegrass, orchardgrass, bromegrass, clover, and alfalfa.

Wild herbaceous plants are native or naturally established grasses and forbs, including weeds. Soil properties and features that affect the growth of these plants are depth of the root zone, texture of the surface layer, available water capacity, wetness, surface stoniness, and flood hazard. Soil temperature and soil moisture are also considerations. Examples of wild herbaceous plants are bluestem, goldenrod, panicgrass, foxtail, wild carrot, quackgrass, and ragweed.

Hardwood trees and shrubs produce nuts or other fruit, buds, catkins, twigs, bark, and foliage. Soil properties and features that affect the growth of hardwood trees and shrubs are depth of the root zone, available water capacity, and wetness. Examples of these plants are oak, birch, cherry, maple, apple, hawthorn, dogwood, hickory, blackberry, and blueberry. Examples of fruit-producing shrubs that are suitable for planting on soils rated *good* are gray dogwood, silky dogwood, blueberry, and crabapple.

Coniferous plants furnish browse and seeds. Soil properties and features that affect the growth of coniferous trees, shrubs, and ground cover are depth of the root zone, available water capacity, and wetness. Examples of coniferous plants are pine, spruce, yew, redcedar, and hemlock.

Wetland plants are annual and perennial wild herbaceous plants that grow on moist or wet sites. Submerged or floating aquatic plants are excluded. Soil properties and features affecting wetland plants are texture of the surface layer, wetness, reaction, slope, and surface stoniness. Examples of wetland plants are smartweed, cattail, cutgrass, bulrush, sedges, and reeds.

Shallow water areas have an average depth of less than 5 feet. Some are naturally wet areas. Others are created by dams, levees, or other water-control structures. Soil properties and features affecting shallow water areas are depth to bedrock, wetness, surface stoniness, slope, and permeability. Examples of shallow water areas are marshes, waterfowl feeding areas, and ponds.

The habitat for various kinds of wildlife is described in the following paragraphs.

Habitat for openland wildlife consists of cropland, pasture, meadows, and areas that are overgrown with grasses, herbs, shrubs, and vines. These areas produce grain and seed crops, grasses and legumes, and wild herbaceous plants. The wildlife attracted to these areas include bobwhite quail, meadow vole, meadowlark, field sparrow, cottontail, and red fox.

Habitat for woodland wildlife consists of areas of deciduous plants or coniferous plants or both and associated grasses, legumes, and wild herbaceous plants. Wildlife attracted to these areas include wild turkey, ruffed grouse, woodcock, thrushes, woodpeckers, squirrels, gray fox, raccoon, and deer.

Habitat for wetland wildlife consists of open, marshy or swampy shallow water areas. Some of the wildlife attracted to such areas are ducks, geese, herons, shore birds, muskrat, frogs, and tree swallow.

Engineering

Michael M. Blaine, engineer, Soil Conservation Service, helped to prepare this section.

This section provides information for planning land uses related to urban development and to water management. Soils are rated for various uses, and the most limiting features are identified. The ratings are given in the following tables: Building site development, Sanitary facilities, Construction materials, and Water management. The ratings are based on observed performance of the soils and on the estimated data and test data in the "Soil Properties" section.

Information in this section is intended for land use planning, for evaluating land use alternatives, and for planning site investigations prior to design and construction. The information, however, has limitations. For example, estimates and other data generally apply only to that part of the soil within a depth of 5 or 6 feet. Because of the map scale, small areas of different soils may be included within the mapped areas of a specific soil.

The information is not site specific and does not eliminate the need for onsite investigation of the soils or for testing and analysis by personnel experienced in the design and construction of engineering works.

Government ordinances and regulations that restrict certain land uses or impose specific design criteria were not considered in preparing the information in this section. Local ordinances and regulations need to be considered in planning, in site selection, and in design.

Soil properties, site features, and observed performance were considered in determining the ratings in this section. During the fieldwork for this soil survey, determinations were made about grain-size distribution, liquid limit, plasticity index, soil reaction, depth to bedrock, hardness of bedrock within 5 to 6 feet of the surface, soil wetness, depth to a seasonal high water table, slope, likelihood of flooding, natural soil structure aggregation, and soil density. Data were collected about kinds of clay minerals, mineralogy of the sand and silt fractions, and the kind of adsorbed cations. Estimates were made for erodibility, permeability, corrosivity, shrink-swell potential, available water capacity, and other behavioral characteristics affecting engineering uses.

This information can be used to (1) evaluate the potential of areas for residential, commercial, industrial, and recreation uses; (2) make preliminary estimates of construction conditions; (3) evaluate alternative routes for roads, streets, highways, pipelines, and underground cables; (4) evaluate alternative sites for sanitary landfills, septic tank absorption fields, and sewage lagoons; (5) plan detailed onsite investigations of soils and geology; (6) locate potential sources of gravel, sand, earthfill, and topsoil; (7) plan drainage systems, irrigation systems, ponds, agricultural waste storage facilities, and other structures for soil and water conservation; and (8) predict performance of proposed small structures and pavements by comparing the performance of existing similar structures on the same or similar soils.

The information in the tables, along with the soil maps, the soil descriptions, and other data provided in this survey can be used to make additional interpretations.

Some of the terms used in this soil survey have a special meaning in soil science and are defined in the Glossary.

Building Site Development

Table 11 shows the degree and kind of soil limitations that affect shallow excavations, dwellings with and without basements, small commercial buildings, local roads and streets, and lawns and landscaping. The limitations are considered *slight* if soil properties and site features are generally favorable for the indicated use and limitations are minor and easily overcome; *moderate* if soil properties or site features are not favorable for the indicated use and special planning, design, or maintenance is needed to overcome or minimize the limitations; and *severe* if soil properties or site features are so unfavorable or so difficult to overcome that special design, significant increases in construction costs, and possibly increased maintenance are required. Special feasibility studies may be required where the soil limitations are severe.

Shallow excavations are trenches or holes dug to a maximum depth of 5 or 6 feet for basements, graves, utility lines, open ditches, and other purposes. The ratings are based on soil properties, site features, and observed performance of the soils. The ease of digging, filling, and compacting is affected by the depth to bedrock, a cemented pan, or a very firm dense layer; stone content; soil texture; and slope. The time of the year that excavations can be made is affected by the depth to a seasonal high water table and the susceptibility of the soil to flooding. The resistance of the excavation walls or banks to sloughing or caving is affected by soil texture and the depth to the water table.

Dwellings and small commercial buildings are structures built on shallow foundations on undisturbed soil. The load limit is the same as that for single-family dwellings no higher than three stories. Ratings are made for small commercial buildings without basements, for dwellings with basements, and for dwellings without basements. The ratings are based on soil properties, site features, and observed performance of the soils. A high water table, flooding, shrink-swell potential, and organic layers can cause the movement of footings. A high water table, depth to bedrock or to a cemented pan, large stones, slope, and flooding affect the ease of excavation and construction. Landscaping and grading that require cuts and fills of more than 5 to 6 feet are not considered.

Local roads and streets have an all-weather surface and carry automobile and light truck traffic all year. They have a subgrade of cut or fill soil material, a base of gravel, crushed rock, or stabilized soil material, and a flexible or rigid surface. Cuts and fills are generally limited to less than 6 feet. The ratings are based on soil properties, site features, and observed performance of the soils. Depth to bedrock or to a cemented pan, a high water table, flooding, large stones, and slope affect the ease of excavating and grading. Soil strength (as inferred from the engineering classification of the soil), shrink-swell potential, frost action potential, and depth to a high water table affect the traffic supporting capacity.

Lawns and landscaping require soils on which turf and ornamental trees and shrubs can be established and maintained. The ratings are based on soil properties, site features, and observed performance of the soils. Soil reaction, a high water table, depth to bedrock or to a cemented pan, the available water capacity in the upper 40 inches, and the content of sulfidic materials affect plant growth. Flooding, wetness, slope, stoniness, and the amount of sand, clay, or organic matter in the surface layer affect trafficability after vegetation is established.

Sanitary Facilities

Table 12 shows the degree and kind of soil limitations that affect septic tank absorption fields, sewage lagoons, sanitary landfills, and application of agricultural waste. The limitations are considered *slight* if soil properties and site features are generally favorable for the indicated use and limitations are minor and easily overcome; *moderate* if soil properties or site features are not favorable for the indicated use and special planning, design, or maintenance is needed to overcome or minimize the limitations; and *severe* if soil properties or site features are so unfavorable or so difficult to overcome that special design, significant increases in construction costs, and possibly increased maintenance are required.

Table 12 also shows the suitability of the soils for use as daily cover for landfills. A rating of *good* indicates that soil properties and site features are favorable for the use and good performance and low maintenance can be expected; *fair* indicates that soil properties and site features are moderately favorable for the use and one or more soil properties or site features make the soil less desirable than the soils rated good; and *poor* indicates that one or more soil properties or site features are unfavorable for the use and overcoming the unfavorable properties requires special design, extra maintenance, or costly alteration.

Septic tank absorption fields are areas in which effluent from a septic tank is distributed into the soil through subsurface tiles or perforated pipe. Only that part of the soil between depths of 24 and 72 inches is evaluated. The ratings are based on soil properties, site features, and observed performance of the soils. Permeability, a high water table, depth to bedrock or to a cemented pan, and flooding affect absorption of the effluent. Large stones and bedrock or a cemented pan interfere with installation.

Unsatisfactory performance of septic tank absorption fields, including excessively slow absorption of effluent, surfacing of effluent, and hillside seepage, can affect public health. Ground water can be polluted if highly permeable sand and gravel or fractured bedrock is less than 4 feet below the base of the absorption field, if slope is excessive, or if the water table is near the surface. There must be unsaturated soil material beneath the absorption field to filter the effluent effectively. Many local ordinances require that this material be of a certain thickness.

Sewage lagoons are shallow ponds constructed to hold sewage while aerobic bacteria decompose the solid and liquid wastes. Lagoons should have a nearly level floor surrounded by cut slopes or embankments of compacted soil. Lagoons generally are designed to hold the sewage within a depth of 2 to 5 feet. Nearly impervious soil material for the lagoon floor and sides is required to minimize seepage and contamination of ground water.

Table 12 gives ratings for the natural soil that makes up the lagoon floor. The surface layer and, generally, 1 or 2 feet of soil material below the surface layer are excavated to provide material for the embankments. The ratings are based on soil properties, site features, and observed performance of the soils. Considered in the ratings are slope, permeability, a high water table, depth to bedrock or to a cemented pan, flooding, large stones, and content of organic matter.

Excessive seepage due to rapid permeability of the soil or a water table that is high enough to raise the level of sewage in the lagoon causes a lagoon to function unsatisfactorily. Pollution results if seepage is excessive or if floodwater overtops the lagoon. A high content of organic matter is detrimental to proper functioning of the lagoon because it inhibits aerobic activity. Slope, bedrock, and cemented pans can cause construction problems, and large stones can hinder compaction of the lagoon floor.

Sanitary landfills are areas where solid waste is disposed of by burying it in soil. There are two types of landfill—trench and area. In a trench landfill, the waste is placed in a trench. It is spread, compacted, and covered daily with a thin layer of soil excavated at the site. In an area landfill, the waste is placed in successive layers on the surface of the soil. The waste is spread, compacted, and covered daily with a thin layer of soil from a source away from the site.

Both types of landfill must be able to bear heavy vehicular traffic. Both types involve a risk of ground water pollution. Ease of excavation and revegetation needs to be considered.

The ratings in table 12 are based on soil properties, site features, and observed performance of the soils. Permeability, depth to bedrock or to a cemented pan, a high water table, slope, and flooding affect both types of landfill. Texture, stones and boulders, highly organic layers, soil reaction, and content of salts and sodium affect trench type landfills. Unless otherwise stated, the ratings apply only to that part of the soil within a depth of about 6 feet. For deeper trenches, a limitation rated slight or moderate may not be valid. Onsite investigation is needed.

Daily cover for landfill is the soil material that is used to cover compacted solid waste in an area type sanitary landfill. The soil material is obtained offsite, transported to the landfill, and spread over the waste.

Soil texture, wetness, coarse fragments, and slope affect the ease of removing and spreading the material during wet and dry periods. Loamy or silty soils that are free of large stones or excess gravel are the best cover for a landfill. Clayey soils are sticky or cloddy and are difficult to spread; sandy soils are subject to soil blowing.

After soil material has been removed, the soil material remaining in the borrow area must be thick enough over bedrock, a cemented pan, or the water table to permit revegetation. The soil material used as final cover for a landfill should be suitable for plants. The surface layer generally has the best workability, more organic matter, and the best potential for plants. Material from the surface layer should be stockpiled for use as the final cover.

Application of agricultural waste refers to the surface application of livestock manure. Because the manure is labile when stored or treated, it can be solid, slurry, or liquid in consistency, depending on the type of bedding used and whether the it is diluted or allowed to dry.

The nitrogen content of manure is variable. If the content is high, the allowable rate of application is limited. Toxic waste is not included in the definition of agricultural waste as used in table 12.

The soil properties and features considered in the ratings are those that affect soil absorption, plant growth, microbial activity, and the rate and method of application of the waste. Permeability, depth to the water table, depth to bedrock, slope, and rock fragments affect the volume of waste that can be absorbed by the soil without resulting in excessive runoff or pollution of the ground water. The soil reaction, measured by the pH value, affects plant growth and microbial activity. Flooding can result in the pollution of surface water if it occurs shortly after application of waste. Ground water may be polluted if waste is applied to areas underlain by cavernous limestone or pervious bedrock (fig. 12).

Construction Materials

Table 13 gives information about the soils as a source of roadfill, sand, gravel, and topsoil. The soils are rated *good, fair,* or *poor* as a source of roadfill and topsoil. They are rated as a *probable* or *improbable* source of sand and gravel. The ratings are based on soil properties and site features that affect the removal of the soil and its use as construction material. Normal compaction, minor processing, and other standard construction practices are assumed. Each soil is evaluated to a depth of 5 or 6 feet.

Roadfill is soil material that is excavated in one place and used in road embankments in another place. In this table, the soils are rated as a source of roadfill for low embankments, generally less than 6 feet high and less exacting in design than higher embankments.

The ratings are for the soil material below the surface layer to a depth of 5 or 6 feet. It is assumed that soil layers will be mixed during excavating and spreading. Many soils have layers of contrasting suitability within their profile. The table showing engineering index properties provides detailed information about each soil layer. This information can help determine the suitability of each layer for use as roadfill. The performance of soil after it is stabilized with lime or cement is not considered in the ratings.

The ratings are based on soil properties, site features, and observed performance of the soils. The thickness of suitable material is a major consideration. The ease of excavation is affected by large stones, a high water table, and slope. How well the soil performs in place after it has been compacted and drained is determined by its strength (as inferred from the engineering classification of the soil) and shrink-swell potential.

Soils rated *good* contain significant amounts of sand or gravel or both. They have at least 5 feet of suitable material, low shrink-swell potential, few cobbles and stones, and slopes of 15 percent or less. Depth to the water table is more than 3 feet. Soils rated *fair* are more than 35 percent silt- and clay-sized particles and have a plasticity index of less than 10. They have moderate shrink-swell potential, slopes of 15 to 25 percent, or many stones. Depth to the water table is 1 to 3 feet. Soils rated *poor* have a plasticity index of more than 10, a high shrink-swell potential, many stones, or slopes of more than 25 percent. They are wet, and the depth to the water table is less than 1 foot. They may have layers of suitable material, but the material is less than 3 feet thick.

Sand and gravel are natural aggregates suitable for commercial use with a minimum of processing. Sand and gravel are used in many kinds of construction. Specifications for each use vary widely. In table 13, only the probability of finding material in suitable quantity is evaluated. The suitability of the material for specific purposes is not evaluated, nor are factors that affect excavation of the material.

The properties used to evaluate the soil as a source of sand or gravel are gradation of grain sizes (as indicated by the engineering classification of the soil),

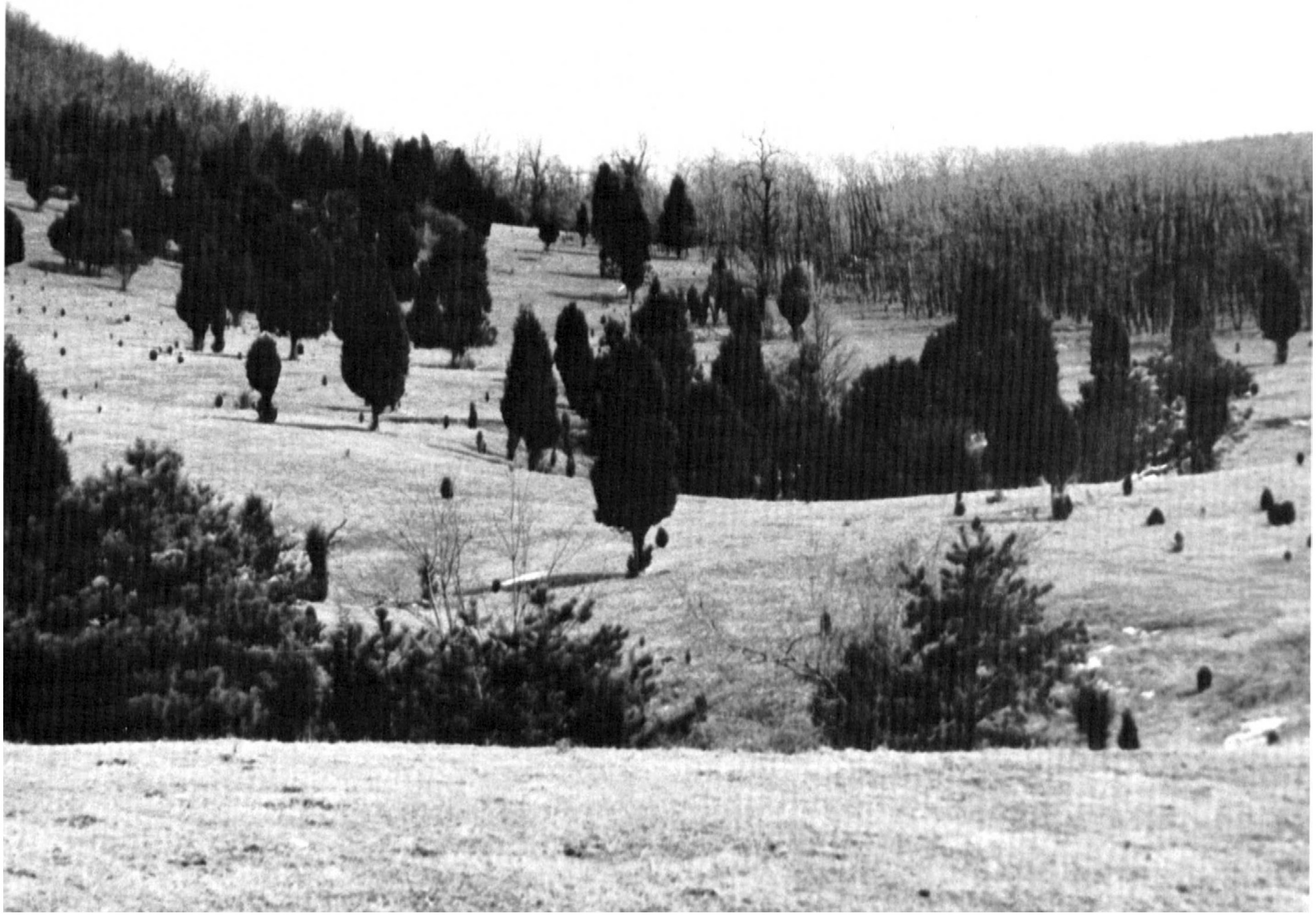

Figure 12.—Typical area of Opequon silt loam, 3 to 15 percent slopes, very rocky, showing the karst topography. Ground water may be polluted if agricultural waste is applied to these areas.

the thickness of suitable material, and the content of rock fragments. Kinds of rock, acidity, and stratification are given in the soil series descriptions. Gradation of grain sizes is given in the table on engineering index properties.

A soil rated as a probable source has a layer of clean sand or gravel or a layer of sand or gravel that is up to 12 percent silty fines. This material must be at least 3 feet thick and less than 50 percent, by weight, large stones. All other soils are rated as an improbable source. Coarse fragments of soft bedrock, such as shale and siltstone, are not considered to be sand and gravel.

Topsoil is used to cover an area so that vegetation can be established and maintained. The upper 40 inches of a soil is evaluated for use as topsoil. Also evaluated is the reclamation potential of the borrow area.

Plant growth is affected by toxic material and by such properties as soil reaction, available water capacity, and fertility. The ease of excavating, loading, and spreading is affected by rock fragments, slope, a water table, soil texture, and thickness of suitable material. Reclamation of the borrow area is affected by slope, a water table, rock fragments, bedrock, and toxic material.

Soils rated *good* have friable loamy material to a depth of at least 40 inches. They are free of stones and cobbles, have little or no gravel, and have slopes of less than 8 percent. They are naturally fertile or respond well to fertilizer and are not so wet that excavation is difficult.

Soils rated *fair* are sandy soils, loamy soils that have a relatively high content of clay, soils that have only 20 to 40 inches of suitable material, soils that have an appreciable amount of gravel or stones, or soils that have slopes of 8 to 15 percent. The soils are not so wet that excavation is difficult.

Soils rated *poor* are very sandy or clayey, have less than 20 inches of suitable material, have a large amount of gravel or stones, have slopes of more than 15 percent, or have a seasonal water table at or near the surface.

The surface layer of most soils is generally preferred for topsoil because of its organic matter content. Organic matter greatly increases the absorption and retention of moisture and nutrients for plant growth.

Water Management

Table 14 gives information on the soil properties and site features that affect water management. The degree and kind of soil limitations are given for pond reservoir areas and for embankments, dikes, and levees. The limitations are considered *slight* if soil properties and site features generally are favorable for the indicated use and limitations are minor and are easily overcome; *moderate* if soil properties or site features are not favorable for the indicated use and special planning, design, or maintenance is needed to overcome or minimize the limitations; and *severe* if soil properties or site features are so unfavorable or so difficult to overcome that special design, significant increase in construction costs, and possibly increased maintenance are required.

This table also gives for each soil the restrictive features that affect drainage, terraces and diversions, and grassed waterways.

Pond reservoir areas hold water behind a dam or embankment. Soils best suited to this use have low seepage potential in the upper 60 inches. The seepage potential is determined by the permeability of the soil and the depth to fractured bedrock or other permeable material. Excessive slope can affect the storage capacity of the reservoir area.

Embankments, dikes, and levees are raised structures of soil material, generally less than 20 feet high, constructed to impound water or to protect land against overflow. In this table, the soils are rated as a source of material for embankment fill. The ratings apply to the soil material below the surface layer to a depth of about 5 feet. It is assumed that soil layers will be uniformly mixed and compacted during construction.

The ratings do not indicate the ability of the natural soil to support an embankment. Soil properties to a depth even more than the height of the embankment can affect performance and safety of the embankment. Generally, deeper onsite investigation is needed to determine these properties.

Soil material in embankments must be resistant to seepage, piping, and erosion and have favorable compaction characteristics. Unfavorable features include less than 5 feet of suitable material and a high content of stones or boulders or of organic matter. A high water table affects the amount of usable material. It also affects trafficability.

Drainage is the removal of excess surface and subsurface water from the soil. How easily and effectively the soil is drained depends on the depth to bedrock, to a cemented pan, or to other layers that affect the rate of water movement; permeability; depth to a high water table or depth of standing water if the soil is subject to ponding; slope; susceptibility to flooding; subsidence of organic layers; and potential frost action. Excavating and grading and the stability of ditchbanks are affected by depth to bedrock or to a cemented pan, large stones, slope, and the hazard of cutbanks caving. The productivity of the soil after drainage is adversely affected by extreme acidity or by toxic substances in the root zone, such as sulfur. Availability of drainage outlets is not considered in the ratings.

Terraces and diversions are embankments or a combination of channels and ridges constructed across a slope to reduce erosion and conserve moisture by intercepting runoff. Slope, wetness, large stones, and depth to bedrock or to a cemented pan affect the construction of terraces and diversions. A restricted rooting depth, a severe hazard of water erosion, an excessively coarse texture, and restricted permeability adversely affect maintenance.

Grassed waterways are natural or constructed channels, generally broad and shallow, that conduct surface water to outlets at a nonerosive velocity. Large stones, wetness, slope, and depth to bedrock or to a cemented pan affect the construction of grassed waterways. A low available water capacity, restricted rooting depth, and restricted permeability adversely affect the growth and maintenance of the grass after construction.

Soil Properties

Data relating to soil properties are collected during the course of the soil survey. The data and the estimates of soil and water features, listed in tables, are explained on the following pages.

Soil properties are determined by field examination of the soils and by laboratory index testing of some benchmark soils. Established standard procedures are followed. During the survey, many shallow borings are made and examined to identify and classify the soils and to delineate them on the soil maps. Samples are taken from some typical profiles and tested in the laboratory to determine grain-size distribution, plasticity, and compaction characteristics.

Estimates of soil properties are based on field examinations, on laboratory tests of samples from the survey area, and on laboratory tests of samples of similar soils in nearby areas. Tests verify field observations, verify properties that cannot be estimated accurately by field observation, and help characterize key soils.

The estimates of soil properties shown in the tables include the range of grain-size distribution and Atterberg limits, the engineering classifications, and the physical and chemical properties of the major layers of each soil. Pertinent soil and water features also are given.

Engineering Index Properties

Table 15 gives estimates of the engineering classification and of the range of index properties for the major layers of each soil in the survey area. Most soils have layers of contrasting properties within the upper 5 or 6 feet.

Depth to the upper and lower boundaries of each layer is indicated. The range in depth and information on other properties of each layer are given for each soil series under "Taxonomic Units and Their Morphology."

Texture is given in the standard terms used by the U.S. Department of Agriculture. These terms are defined according to percentages of sand, silt, and clay in the fraction of the soil that is less than 2 millimeters in diameter. "Loam," for example, is soil that is 7 to 27 percent clay, 28 to 50 percent silt, and less than 52 percent sand. If the content of particles coarser than sand is as much as about 15 percent, an appropriate modifier is added, for example, "gravelly." Textural terms are defined in the Glossary.

Classification of the soils is determined according to the Unified soil classification system *(2)* and the system adopted by the American Association of State Highway and Transportation Officials *(1)*.

The Unified system classifies soils according to properties that affect their use as construction material. Soils are classified according to grain-size distribution of the fraction less than 3 inches in diameter and according to plasticity index, liquid limit, and organic matter content. Sandy and gravelly soils are identified as GW, GP, GM, GC, SW, SP, SM, and SC; silty and clayey soils as ML, CL, OL, MH, CH, and OH; and highly organic soils as PT. Soils exhibiting engineering properties of two groups can have a dual classification, for example, CL-ML.

The AASHTO system classifies soils according to those properties that affect roadway construction and maintenance. In this system, the fraction of a mineral soil that is less than 3 inches in diameter is classified in one of seven groups from A-1 through A-7 on the basis of grain-size distribution, liquid limit, and plasticity index. Soils in group A-1 are coarse grained and low in content of fines (silt and clay). At the other extreme, soils in group A-7 are fine grained. Highly organic soils are classified in group A-8 on the basis of visual inspection.

Rock fragments larger than 3 inches in diameter are indicated as a percentage of the total soil on a dry-weight basis. The percentages are estimates determined mainly by converting volume percentage in the field to weight percentage.

Percentage (of soil particles) passing designated sieves is the percentage of the soil fraction less than 3 inches in diameter based on an ovendry weight. The sieves, numbers 4, 10, 40, and 200 (USA Standard Series), have openings of 4.76, 2.00, 0.420, and 0.074 millimeters, respectively. Estimates are based on laboratory tests of soils sampled in the survey area and in nearby areas and on estimates made in the field.

Liquid limit and *plasticity index* (Atterberg limits) indicate the plasticity characteristics of a soil. The estimates are based on test data from the survey area or from nearby areas and on field examination.

The estimates of grain-size distribution, liquid limit, and plasticity index are generally rounded to the nearest 5 percent. Thus, if the ranges of gradation and Atterberg limits extend a marginal amount (1 or 2 percentage points) across classification boundaries, the classification in the marginal zone is omitted in the table.

Physical and Chemical Properties

Table 16 shows estimates of some characteristics and features that affect soil behavior. These estimates are given for the major layers of each soil in the survey area. The estimates are based on field observations and on test data for these and similar soils.

Clay as a soil separate consists of mineral soil particles that are less than 0.002 millimeter in diameter. In this table, the estimated clay content of each major soil layer is given as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

The amount and kind of clay greatly affect the fertility and physical condition of the soil. They determine the ability of the soil to adsorb cations and to retain moisture. They influence shrink-swell potential, permeability, and plasticity, the ease of soil dispersion, and other soil properties. The amount and kind of clay in a soil also affect tillage and earthmoving operations.

Moist bulk density is the weight of soil (ovendry) per unit volume. Volume is measured when the soil is at field moisture capacity, that is, the moisture content at ⅓ bar moisture tension. Weight is determined after drying the soil at 105 degrees C. In this table, the estimated moist bulk density of each major soil horizon is expressed in grams per cubic centimeter of soil material that is less than 2 millimeters in diameter. Bulk density data are used to compute shrink-swell potential, available water capacity, total pore space, and other soil properties. The moist bulk density of a soil indicates the pore space available for water and roots. A bulk density of more than 1.6 can restrict water storage and root penetration. Moist bulk density is influenced by texture, kind of clay, content of organic matter, and soil structure.

Permeability refers to the ability of a soil to transmit water or air. The estimates indicate the rate of movement of water when the soil is saturated. They are based on soil characteristics observed in the field, particularly structure, porosity, and texture. Permeability is considered in the design of soil drainage systems, septic tank absorption fields, and construction where the rate of water movement under saturated conditions affects behavior.

Available water capacity refers to the quantity of water that the soil is capable of storing for use by plants. The capacity for water storage is given in inches of water per inch of soil for each major soil layer. The capacity varies, depending on soil properties that affect the retention of water and the depth of the root zone. The most important properties are the content of organic matter, soil texture, bulk density, and soil structure. Available water capacity is an important factor in the choice of plants or crops to be grown and in the design and management of irrigation systems. Available water capacity is not an estimate of the quantity of water actually available to plants at any given time.

Soil reaction is a measure of acidity or alkalinity and is expressed as a range in pH values. The range in pH of each major horizon is based on many field tests. For many soils, values have been verified by laboratory analyses. Soil reaction is important in selecting crops and other plants, in evaluating soil amendments for fertility and stabilization, and in determining the risk of corrosion.

Shrink-swell potential is the potential for volume change in a soil with a loss or gain in moisture. Volume change occurs mainly because of the interaction of clay minerals with water and varies with the amount and type of clay minerals in the soil. The size of the load on the soil and the magnitude of the change in soil moisture content influence the amount of swelling of soils in place. Laboratory measurements of swelling of undisturbed clods were made for many soils. For others, swelling was estimated on the basis of the kind and amount of clay minerals in the soil and on measurements of similar soils.

If the shrink-swell potential is rated moderate to very high, shrinking and swelling can cause damage to buildings, roads, and other structures. Special design is often needed.

Shrink-swell potential classes are based on the change in length of an unconfined clod as moisture content is increased from air-dry to field capacity. The change is based on the soil fraction less than 2 millimeters in diameter. The classes are *low*, a change of less than 3 percent; *moderate*, 3 to 6 percent; and *high*, more than 6 percent. *Very high*, greater than 9 percent, is sometimes used.

Erosion factor K indicates the susceptibility of a soil to sheet and rill erosion by water. Factor K is one of six factors used in the Universal Soil Loss Equation (USLE) to predict the average annual rate of soil loss by sheet and rill erosion in tons per acre per year. The estimates are based primarily on percentage of silt, sand, and organic matter (up to 4 percent) and on soil structure and permeability. Values of K range from 0.05 to 0.69.

The higher the value, the more susceptible the soil is to sheet and rill erosion by water.

Erosion factor T is an estimate of the maximum average annual rate of soil erosion by wind or water that can occur without affecting crop productivity over a sustained period. The rate is in tons per acre per year.

Organic matter is the plant and animal residue in the soil at various stages of decomposition. In table 16, the estimated content of organic matter is expressed as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

The content of organic matter of a soil can be maintained or increased by returning crop residue to the soil. Organic matter affects the available water capacity, infiltration rate, and tilth. It is a source of nitrogen and other nutrients for crops.

Soil and Water Features

Table 17 gives estimates of various soil and water features. The estimates are used in land use planning that involves engineering considerations.

Hydrologic soil groups are used to estimate runoff from precipitation. Soils not protected by vegetation are assigned to one of four groups. They are grouped according to the intake of water when the soils are thoroughly wet and receive precipitation from long-duration storms.

The four hydrologic soil groups are:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a permanent high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

Some soils in table 17 are assigned to two hydrologic groups. For soils that have a seasonal high water table and can be drained, the first letter in the hydrologic group is for drained areas and the second is for undrained areas. For soils that are less than 20 inches deep over bedrock, the first letter is for areas where the bedrock is cracked and pervious and the second letter is for areas where exposed bedrock makes up more than 25 percent of the surface.

Flooding, the temporary inundation of an area, is caused by overflowing streams or by runoff from adjacent slopes. Water standing for short periods after rainfall or snowmelt is not considered flooding, nor is water in swamps and marshes.

Table 17 gives the estimated frequency of flooding. Frequency is expressed as none, rare, occasional, and frequent. *None* means that flooding is not probable; *rare* that it is unlikely but possible under unusual weather conditions (0 to 5 percent chance in any year); *occasional* that it occurs infrequently under normal weather conditions (5 to 50 percent chance in any year); and *frequent* that it occurs often under normal weather conditions (more than 50 percent chance in any year). *Common* means that a rating of occasional or frequent would not affect interpretations.

The information is based on evidence in the soil profile, namely thin strata of gravel, sand, silt, or clay deposited by floodwater; irregular decrease in organic matter content with increasing depth; and absence of distinctive horizons that form in soils that are not subject to flooding.

Also considered are local information about the extent and levels of flooding and the relation of each soil on the landscape to historic floods. Information on the extent of flooding based on soil data is less specific than that provided by detailed engineering surveys that delineate flood-prone areas at specific flood frequency levels.

High water table (seasonal) is the highest level of a saturated zone in the soil in most years. The depth to a seasonal high water table applies to undrained soils. The estimates are based mainly on the evidence of a saturated zone, namely grayish colors or mottles in the soil. Indicated in table 17 are the depth to the seasonal high water table and the kind of water table—that is, perched, artesian, or apparent. A water table that is seasonally high for less than 1 month is not indicated in table 17.

An *apparent* water table is a thick zone of free water in the soil. It is indicated by the level at which water stands in an uncased borehole after adequate time is allowed for adjustment in the surrounding soil. An *artesian* water table is under hydrostatic head, generally below an impermeable layer. If this layer is penetrated, the water level rises in an uncased borehole. A *perched* water table is water standing above an unsaturated zone. In places an upper, or perched, water table is separated from a lower one by a dry zone.

Only saturated zones within a depth of about 6 feet are indicated. The first numeral in the range indicates how high the water rises above the surface. The second numeral indicates the depth below the surface. Depth is rounded to the nearest half foot. "More than 6.0" indicates that the water table is below a depth of 6 feet or that the water table exists for less than a month.

Depth to bedrock is given if bedrock is within a depth of 5 feet. The depth is based on many soil borings and on observations during soil mapping. The rock is either soft or hard. If the rock is soft or fractured, excavations can be made with trenching machines, backhoes, or small rippers. If the rock is hard or massive, blasting or special equipment generally is needed for excavation.

Potential frost action is the likelihood of upward or lateral expansion of the soil caused by the formation of segregated ice lenses (frost heave) and the subsequent collapse of the soil and loss of strength on thawing. Frost action occurs when moisture moves into the freezing zone of the soil. Temperature, texture, density, permeability, content of organic matter, and depth to the water table are the most important factors considered in evaluating the potential for frost action. It is assumed that the soil is not insulated by vegetation or snow and is not artificially drained. Silty and highly structured clayey soils that have a high water table in winter are the most susceptible to frost action. Well drained, very gravelly, or very sandy soils are the least susceptible. Frost heave and low soil strength during thawing cause damage mainly to pavements and other rigid structures.

Risk of corrosion pertains to potential soil-induced electrochemical or chemical action that dissolves or weakens uncoated steel or concrete. The rate of corrosion of uncoated steel is related to such factors as soil moisture, particle-size distribution, acidity, and electrical conductivity of the soil. The rate of corrosion of concrete is based mainly on the sulfate and sodium content, texture, moisture content, and acidity of the soil. Special site examination and design may be needed if the combination of factors creates a severe corrosion environment. The steel in installations that intersect soil boundaries or soil layers is more susceptible to corrosion than steel in installations that are entirely within one kind of soil or within one soil layer.

For uncoated steel, the risk of corrosion, expressed as *low*, *moderate*, or *high*, is based on soil drainage class, total acidity, electrical resistivity near field capacity, and electrical conductivity of the saturation extract.

For concrete, the risk of corrosion is also expressed as *low*, *moderate*, or *high*. It is based on soil texture, acidity, and amount of sulfates in the saturation extract.

Classification of the Soils

The system of soil classification used by the National Cooperative Soil Survey has six categories *(15)*. Beginning with the broadest, these categories are the order, suborder, great group, subgroup, family, and series. Classification is based on soil properties observed in the field or inferred from those observations or from laboratory measurements. Table 18 shows the classification of the soils in the survey area. The categories are defined in the following paragraphs.

ORDER. Eleven soil orders are recognized. The differences among orders reflect the dominant soil-forming processes and the degree of soil formation. Each order is identified by a word ending in *sol*. An example is Ultisol.

SUBORDER. Each order is divided into suborders primarily on the basis of properties that influence soil genesis and are important to plant growth or properties that reflect the most important variables within the orders. The last syllable in the name of a suborder indicates the order. An example is Udult (*Ud*, meaning humid, plus *ult*, from Ultisol).

GREAT GROUP. Each suborder is divided into great groups on the basis of close similarities in kind, arrangement, and degree of development of pedogenic horizons; soil moisture and temperature regimes; and base status. Each great group is identified by the name of a suborder and by a prefix that indicates a property of the soil. An example is Hapludults (*Hapl*, meaning minimal horizonation, plus *udult*, the suborder of the Ultisols that has a udic moisture regime).

SUBGROUP. Each great group has a typic subgroup. Other subgroups are intergrades or extragrades. The typic is the central concept of the great group; it is not necessarily the most extensive. Intergrades are transitions to other orders, suborders, or great groups. Extragrades have some properties that are not representative of the great group but do not indicate transitions to any other known kind of soil. Each subgroup is identified by one or more adjectives preceding the name of the great group. The adjective *Typic* identifies the subgroup that typifies the great group. An example is Typic Hapludults.

FAMILY. Families are established within a subgroup on the basis of physical and chemical properties and other characteristics that affect management. Mostly the properties are those of horizons below plow depth where there is much biological activity. Among the properties and characteristics considered are particle-size class, mineral content, temperature regime, depth of the root zone, consistence, moisture equivalent, slope, and permanent cracks. A family name consists of the name of a subgroup preceded by terms that indicate soil properties. An example is fine-loamy, mixed, mesic Typic Hapludults.

SERIES. The series consists of soils that have similar horizons in their profile. The horizons are similar in color, texture, structure, reaction, consistence, mineral and chemical composition, and arrangement in the profile. The texture of the surface layer or of the substratum can differ within a series.

Taxonomic Units and Their Morphology

In this section, each taxonomic unit recognized in the survey area is described. The descriptions are arranged in alphabetic order.

Characteristics of the soil and the material in which it formed are identified for each unit. The soil is compared with similar soils and with nearby soils of other units. A pedon, a small three-dimensional area of soil, that is typical of the unit in the survey area is described. The detailed description of each soil horizon follows standards in the *Soil Survey Manual (13)*. Many of the technical terms used in the descriptions are defined in *Soil Taxonomy (15)*. Unless otherwise stated, colors in the descriptions are for moist soil. Following the pedon description is the range of important characteristics of the soils in the unit.

The map units of each taxonomic unit are described in the section "Detailed Soil Map Units."

Allegheny Series

The Allegheny series consists of very deep, well drained soils that formed in acid alluvial material. These soils are on terraces, mainly along rivers. They are in the Valley and Ridge Physiographic Province. Slope ranges from 3 to 15 percent.

Allegheny soils generally are near the moderately well drained Monongahela soils, the somewhat poorly drained Tygart soils, and the poorly drained or very poorly drained Purdy soils. Unlike Allegheny soils, Monongahela soils have a fragipan. Allegheny soils have less clay in the B horizon than the Tygart or Purdy soils.

Typical pedon of Allegheny loam, 3 to 8 percent slopes, in a hay field; 2,000 feet south of Little Stony Run, 8,500 feet east of the South Fork of the South Branch of the Potomac River, 20 feet north of a wooded area:

Ap—0 to 8 inches; dark yellowish brown (10YR 4/4) loam; weak fine granular structure; friable; many roots; slightly acid; abrupt wavy boundary.

BE—8 to 16 inches; yellowish brown (10YR 5/4) loam; moderate medium subangular blocky structure; friable; many roots; strongly acid; clear wavy boundary.

Bt1—16 to 24 inches; yellowish brown (10YR 5/6) silt loam; moderate fine and medium subangular blocky structure; friable; many roots; about 3 percent rock fragments; few faint clay films on faces of peds; strongly acid; clear wavy boundary.

Bt2—24 to 33 inches; yellowish brown (10YR 5/8) silt loam; moderate medium and fine subangular blocky structure; friable; many roots; about 5 percent rock fragments; few faint clay films on faces of peds; strongly acid; clear wavy boundary.

Bt3—33 to 51 inches; yellowish brown (10YR 5/4) loam; common fine brownish yellow (10YR 6/8), pale brown (10YR 6/3), and dark red (2.5YR 3/6) mottles; moderate coarse subangular blocky structure parting to moderate medium platy; friable; common roots; about 10 percent rock fragments; few faint clay films on faces of peds; strongly acid; clear wavy boundary.

BC—51 to 65 inches; yellowish brown (10YR 5/6) gravelly loam; common yellow (10YR 7/8), grayish brown (10YR 5/2), and yellowish red (5YR 5/6) mottles; weak fine subangular blocky structure; friable; few roots; about 15 percent rock fragments; strongly acid.

The thickness of the solum ranges from 30 to more than 60 inches. The depth to bedrock is more than 60 inches. The content of gravel ranges from 0 to 15 percent, by volume, in the upper part of the solum and from 5 to 35 percent in the lower part and in the C horizon. Some pedons have a 2C horizon. This horizon has 35 to 80 percent gravel and cobbles. Reaction generally is strongly acid or very strongly acid, but the surface layer is less acid in limed areas.

The Ap horizon has hue of 10YR, value of 4 or 5, and chroma of 2 to 4. Some pedons have an E horizon. This horizon has hue of 10YR or 7.5YR, value of 4 or 5, and chroma of 3 to 8. In the fine-earth fraction, it is loam or silt loam.

The B horizon has hue of 10YR or 7.5YR, value of 4 or 5, and chroma of 4 to 8. In the fine-earth fraction, it is clay loam, sandy clay loam, loam, silt loam, or silty clay loam. It has weak or moderate, fine to coarse, subangular blocky structure and is friable or firm. In the fine-earth fraction, the BC horizon is fine sandy loam, loam, sandy clay loam, or clay loam. It has weak or moderate, fine or medium, subangular blocky or platy structure and is friable or firm.

The C horizon has hue of 10YR or 7.5YR, value of 4 to 8, and chroma of 2 to 8. In the fine-earth fraction, it is fine sandy loam, loam, sandy clay loam, or clay loam. It is friable or firm.

Belmont Series

The Belmont series consists of deep, well drained soils that formed in material weathered from limestone or calcareous shale. These soils are on uplands. They are in the mountains west of the North Fork of the South Branch of the Potomac River. Slope ranges from 3 to 80 percent.

Belmont soils generally are near the well drained Cateache and Shouns soils. They are deeper over bedrock than the Cateache soils, have fewer rock fragments in the solum, and contain more clay in the B horizon. They are less deep over bedrock than the Shouns soils.

Typical pedon of Belmont silt loam, in an area of Belmont-Cateache silt loams, 15 to 25 percent slopes; in a pasture at the headwaters of Back Run, 125 yards west of a wooded area, ¼ mile east of windmill on Woodland Institute property:

Ap—0 to 9 inches; dark brown (7.5YR 3/2) silt loam; moderate medium granular structure; friable; many roots; about 2 percent rock fragments; neutral; abrupt wavy boundary.

Bt1—9 to 17 inches; reddish brown (5YR 4/4) silt loam; moderate medium subangular blocky structure; friable; common roots; few distinct clay films on faces of peds; few very coarse krotovinas; slightly acid; clear wavy boundary.

Bt2—17 to 26 inches; reddish brown (5YR 4/4) silty clay loam; moderate medium subangular blocky structure; friable; few roots; common distinct clay

films on faces of peds; few very coarse krotovinas; slightly acid; clear wavy boundary.
Bt3—26 to 40 inches; reddish brown (5YR 4/4) silty clay loam; moderate fine and medium subangular blocky structure; friable; few roots; common distinct clay films on faces of peds; few very coarse krotovinas; slightly acid; clear wavy boundary.
C—40 to 48 inches; mixed reddish brown (5YR 4/4) and dark reddish brown (2.5YR 3/4) channery silty clay loam; massive; friable; few roots; about 20 percent rock fragments; neutral; abrupt irregular boundary.
R—48 inches; limestone.

The thickness of the solum ranges from 24 to 44 inches. The depth to bedrock ranges from 40 to 60 inches. The content of limestone, shale, and sandstone fragments ranges from 0 to 20 percent, by volume, in the solum and from 20 to 40 percent in the C horizon. Reaction generally is strongly acid to slightly acid in the upper part of the solum, but the surface layer is less acid in limed areas. The lower part of the solum is moderately acid to neutral. The C horizon is moderately acid to mildly alkaline.

The A horizon has hue of 7.5YR or 10YR and value and chroma of 2 or 3. Some pedons have an E horizon. This horizon has hue of 5YR to 10YR, value of 4 or 5, and chroma of 2 or 3. In the fine-earth fraction, it is silt loam or silty clay loam.

The B horizon has hue of 2.5YR to 7.5YR, value of 4 or 5, and chroma of 3 or 4. In the fine-earth fraction, it is silt loam, silty clay loam, or clay loam and in some pedons has thin layers of silty clay. It has moderate or strong, fine or medium, angular or subangular blocky structure. It is friable or firm.

The C horizon has hue of 2.5YR to 7.5YR, value of 3 to 5, and chroma of 3 or 4. In the fine-earth fraction, it is silty clay loam, clay loam, or silty clay. It is friable or firm.

Berks Series

The Berks series consists of moderately deep, well drained soils that formed in acid material weathered mostly from shale and siltstone and from some sandstone. These soils are on uplands in the Valley and Ridge Physiographic Province. Slope ranges from 8 to 80 percent.

Berks soils generally are near the excessively drained Rushtown soils, the well drained Weikert soils, the moderately well drained Clarksburg and Ernest soils, and Lithic Udorthents. They are less deep over bedrock than Rushtown, Clarksburg, and Ernest soils and are deeper than Weikert soils and Lithic Udorthents. They have more rock fragments throughout than Clarksburg and Ernest soils. Unlike the Berks soils, Clarksburg and Ernest soils have a fragipan.

Typical pedon of Berks channery silt loam, in a wooded area of Berks-Weikert channery silt loams, 25 to 55 percent slopes; 5 feet east of George Washington National Forest Service Road 151, 0.7 mile south of Route 3/4:

Oi—1 inch to 0; partially decomposed moss and hardwood leaves.
A—0 to 1 inch; dark grayish brown (10YR 4/2) channery silt loam; moderate medium granular structure; friable; many roots; about 25 percent rock fragments; very strongly acid; abrupt wavy boundary.
E—1 to 5 inches; yellowish brown (10YR 5/4) channery silt loam; weak fine and medium granular structure; friable; common roots; about 30 percent rock fragments; strongly acid; clear wavy boundary.
BE—5 to 10 inches; brownish yellow (10YR 6/6) channery silt loam; weak fine subangular blocky structure; friable; common roots; about 30 percent rock fragments; strongly acid; clear wavy boundary.
Bw—10 to 16 inches; brownish yellow (10YR 6/6) very channery silt loam; weak fine subangular blocky structure; friable; common roots; few faint silt coatings on faces of peds; about 40 percent rock fragments; strongly acid; clear wavy boundary.
BC—16 to 23 inches; strong brown (7.5YR 5/6) extremely channery silt loam; weak fine subangular blocky structure; friable; common roots; few faint silt coatings on faces of peds; about 70 percent rock fragments; strongly acid; gradual wavy boundary.
C—23 to 37 inches; strong brown (7.5YR 5/6) extremely channery silt loam; common yellowish red (5YR 5/6), brownish yellow (10YR 6/6), pale brown (10YR 6/3), and black (N 2/0) coatings on fragments; massive; friable; few roots; about 80 percent rock fragments; strongly acid; abrupt smooth boundary.
R—37 inches; fractured shale.

The thickness of the solum ranges from 18 to 40 inches. The depth to bedrock ranges from 20 to 40 inches. The content of shale, siltstone, and sandstone rock fragments ranges from 10 to 45 percent, by volume, in the A and E horizons, from 25 to 75 percent in individual subhorizons of the B horizon, and from 35 to 90 percent in the C horizon. Reaction generally is strongly acid or very strongly acid, but the surface layer is less acid in limed areas.

The A horizon has hue of 10YR, value of 2 to 4, and chroma of 1 to 4. In the fine-earth fraction, it is silt loam or loam. The E horizon has hue of 10YR, value of 4 or 5, and chroma of 3 or 4. In the fine-earth fraction, it is loam or silt loam.

The B horizon generally has hue of 10YR or 7.5YR but in some pedons has hue of 5YR in the lower part. It has value of 4 to 6 and chroma of 4 to 8. In the fine-earth fraction, it is silt loam or loam. It has weak or moderate, fine or medium, subangular blocky structure and is friable or very friable.

The C horizon has hue of 5YR to 10YR and value and chroma of 4 to 6. In the fine-earth fraction, it is silt loam or loam. It is friable or very friable.

Blackthorn Series

The Blackthorn series consists of very deep, well drained soils that formed in acid colluvial material over residual material derived from limy shale or limestone. These soils are on uplands in the Valley and Ridge Physiographic Province. Slope ranges from 3 to 55 percent.

Blackthorn soils generally are near the well drained Dekalb, Elliber, and Opequon soils. They are deeper than Dekalb and Opequon soils and have more clay in the lower part of the subsoil than Dekalb and Elliber soils.

Typical pedon of Blackthorn channery sandy loam, in a wooded area of Blackthorn channery sandy loam, 15 to 35 percent slopes, stony; on the west side of Route 23, 1.9 miles south of its intersection with Route 23/1:

A—0 to 2 inches; very dark grayish brown (10YR 3/2) channery sandy loam; moderate fine granular structure; friable; many roots; about 20 percent rock fragments; strongly acid; abrupt wavy boundary.

E—2 to 6 inches; yellowish brown (10YR 5/4) channery sandy loam; moderate medium granular structure; friable; many roots; about 25 percent rock fragments; very strongly acid; clear wavy boundary.

BE—6 to 15 inches; light yellowish brown (10YR 6/4) very channery sandy loam; weak fine subangular blocky structure; friable; many roots; about 35 percent rock fragments; very strongly acid; gradual wavy boundary.

Bw1—15 to 24 inches; yellowish brown (10YR 5/4) very channery sandy loam; weak fine and medium subangular blocky structure; friable; many roots; about 35 percent rock fragments; very strongly acid; gradual wavy boundary.

Bw2—24 to 32 inches; yellowish brown (10YR 5/6) very channery sandy loam; weak fine subangular blocky structure; friable; common roots; about 40 percent rock fragments; strongly acid; clear wavy boundary.

Bt1—32 to 40 inches; brownish yellow (10YR 6/6) very channery loam; weak medium subangular blocky structure; friable; few faint clay films on faces of peds and in pores; few roots; about 40 percent rock fragments; strongly acid; clear wavy boundary.

Bt2—40 to 60 inches; light yellowish brown (10YR 6/4) and yellowish brown (10YR 5/6) very channery sandy loam; weak fine subangular blocky structure; friable; few faint clay films on faces of peds and in pores; few roots; about 45 percent rock fragments; strongly acid; abrupt wavy boundary.

2Bt3—60 to 72 inches; yellowish red (5YR 5/6) clay; weak medium subangular blocky structure; friable; common distinct clay films and common black (5YR 2/1) coatings on faces of peds; few roots; about 5 percent rock fragments; very strongly acid.

The solum is 60 or more inches thick. The depth to bedrock is more than 65 inches. The content of sandstone or chert fragments ranges from 10 to 65 percent in the upper part of the solum, and the content of shale or limestone fragments ranges from 0 to 25 percent in the 2B horizon. Reaction generally is very strongly acid to moderately acid above the 2B horizon, but the surface layer is less acid in limed areas. The 2B horizon is strongly acid or very strongly acid.

The A horizon has hue of 10YR or 7.5YR, value of 3 or 4, and chroma of 2 or 3. The E horizon has hue of 10YR or 7.5YR, value of 5 or 6, and chroma of 2 to 4. In the fine-earth fraction, it is sandy loam or loam.

The BE horizon has hue of 10YR or 7.5YR, value of 5 or 6, and chroma of 3 or 4. It is sandy loam or loam. It has weak, fine or medium, subangular blocky structure.

The Bw and Bt horizons have hue of 10YR or 7.5YR, value of 5 or 6, and chroma of 3 to 6. In the fine-earth fraction, they are loam or sandy loam. They have weak or moderate, fine or medium, subangular blocky structure and are friable. The 2Bt horizon has hue of 2.5YR to 7.5YR, value of 4 to 6, and chroma of 4 to 8. In the fine-earth fraction, it is silty clay loam, silty clay, or clay. It has weak, fine or medium, subangular or angular blocky structure and is friable or firm.

Buchanan Series

The Buchanan series consists of very deep, moderately well drained soils that formed in acid colluvial material. These soils are on uplands in the Valley and Ridge Physiographic Province and on the Appalachian Plateau. Slope ranges from 3 to 15 percent.

Buchanan soils generally are near the well drained Dekalb, Hazleton, and Laidig soils. They have a fragipan, which is not characteristic of the Dekalb and

Hazleton soils. They have low chroma mottles in the upper 10 inches of the argillic horizon, which is not characteristic of the other soils. Buchanan soils have fewer rock fragments in the upper part of the B horizon than Dekalb and Hazleton soils, and they are deeper over bedrock than the Dekalb soils.

Typical pedon of Buchanan loam, in an area of Laidig and Buchanan soils, 3 to 15 percent slopes, stony; 0.7 mile east of U.S. Highway 220, across low water bridge south of Franklin, and 65 yards southwest of access road:

Oi—1 inch to 0; hardwood leaf litter.

A—0 to 1 inch; very dark grayish brown (10YR 3/2) loam; moderate fine granular structure; friable; many roots; about 10 percent rock fragments; strongly acid; abrupt wavy boundary.

E—1 to 3 inches; light yellowish brown (10YR 6/4) channery loam; weak fine granular structure; friable; many roots; about 20 percent rock fragments; strongly acid; clear wavy boundary.

BE—3 to 7 inches; light yellowish brown (10YR 6/4) loam; weak medium subangular blocky structure; friable; common roots; about 10 percent rock fragments; strongly acid; clear wavy boundary.

Bt1—7 to 14 inches; light yellowish brown (10YR 6/4) sandy clay loam; weak medium subangular blocky structure; friable; common roots; few distinct clay films in pores and on faces of peds; about 10 percent rock fragments; strongly acid; clear wavy boundary.

Bt2—14 to 20 inches; yellowish brown (10YR 5/4) channery sandy clay loam; common medium yellowish brown (10YR 5/6) and light brownish gray (10YR 6/2) mottles; moderate medium subangular blocky structure; friable; common faint clay films in pores and on faces of peds; few roots; about 25 percent rock fragments; strongly acid; abrupt wavy boundary.

Btx1—20 to 32 inches; mixed light yellowish brown (10YR 6/4), light gray (10YR 7/2), yellowish brown (10YR 5/4), and strong brown (7.5YR 5/8) channery loam; weak very coarse prismatic structure parting to moderate thick platy; gray (10YR 6/1) prism faces; firm or very firm, and brittle; common prominent clay films on prism faces; about 30 percent rock fragments; strongly acid; gradual wavy boundary.

Btx2—32 to 50 inches; light yellowish brown (10YR 6/4) very channery loam; few brownish yellow (10YR 6/8), dark red (2.5YR 3/6), and light gray (10YR 7/2) mottles; weak very coarse prismatic structure parting to weak medium platy; firm or very firm, and brittle; common prominent clay films on faces of prisms; about 50 percent rock fragments; strongly acid; clear wavy boundary.

C1—50 to 57 inches; pale brown (10YR 6/3) channery loam; common yellowish brown (10YR 5/6), dark yellowish brown (10YR 4/4), light gray (10YR 7/2), and red (2.5YR 4/6) mottles; massive; firm; about 25 percent rock fragments; strongly acid; clear wavy boundary.

C2—57 to 65 inches; light brownish gray (10YR 6/2) channery loam; common yellowish brown (10YR 5/4 and 5/8) and red (2.5YR 4/6) mottles; massive; friable; about 15 percent rock fragments; very strongly acid.

The thickness of the solum ranges from 40 to 60 inches. The depth to bedrock is more than 60 inches. The content of sandstone fragments ranges from 5 to 40 percent in the upper part of the solum and from 10 to 60 percent in the Bx and C horizons. Reaction generally is extremely acid to strongly acid, but the surface layer is less acid in limed areas.

The A horizon has hue of 10YR, value of 3 to 5, and chroma of 1 to 4. The E horizon has hue of 10YR, value of 5 or 6, and chroma of 2 to 4.

The BE and Bt horizons have hue of 10YR or 7.5YR, value of 5 or 6, and chroma of 3 to 6. In the fine-earth fraction, they are loam, sandy clay loam, or clay loam. They have weak to moderate, fine to medium, subangular blocky structure and are friable or firm.

The Btx horizon has hue of 10YR or 7.5YR, value of 5 or 6, and chroma of 3 to 6. In the fine-earth fraction, it is loam, sandy clay loam, or clay loam. It has very weak to moderate, very coarse, prismatic structure parting to weak platy or subangular blocky. It is firm or very firm.

The C horizon has hue of 10YR or 7.5YR, value of 5 or 6, and chroma of 1 to 6. In the fine-earth fraction, it is loam, sandy clay loam, sandy loam, or clay loam. It is friable or firm.

Calvin Series

The Calvin series consists of moderately deep, well drained soils that formed in acid material weathered from interbedded shale, siltstone, and sandstone. These soils are on uplands in the Valley and Ridge Physiographic Province and along the eastern slopes of Allegheny Mountain. Slope ranges from 3 to 80 percent.

Calvin soils generally are near the well drained Dekalb, Hazleton, Lehew, and Shouns soils. They are shallower over bedrock than Hazleton and Shouns soils. They have more silt and less sand throughout than Dekalb, Hazleton, and Lehew soils. Calvin soils have more rock fragments in the B horizon than the Shouns soils.

Typical pedon of Calvin channery silt loam, in an area of Calvin-Dekalb-Hazleton complex, 35 to 55 percent slopes, stony; 0.5 mile north of Route 33, along the Hall Spring hunters access road, in the George Washington National Forest:

A—0 to 2 inches; dark reddish brown (5YR 3/2) channery silt loam; weak very fine granular structure; very friable; many roots; about 20 percent rock fragments; strongly acid; abrupt wavy boundary.

BA—2 to 6 inches; reddish brown (2.5YR 4/4) channery silt loam; weak very fine subangular blocky and weak fine granular structure; friable; common roots; about 20 percent rock fragments; strongly acid; clear wavy boundary.

Bw1—6 to 9 inches; reddish brown (2.5YR 4/4) channery silt loam; weak fine and medium subangular blocky structure; friable; common roots; about 30 percent rock fragments; very strongly acid; clear wavy boundary.

Bw2—9 to 13 inches; reddish brown (2.5YR 4/4) very channery silt loam; weak fine subangular blocky structure; friable; common roots; about 50 percent rock fragments; very strongly acid; clear wavy boundary.

BC—13 to 18 inches; reddish brown (2.5YR 4/4) very channery silt loam; weak fine subangular blocky structure; friable; common roots; about 55 percent rock fragments; very strongly acid; clear wavy boundary.

C—18 to 24 inches; reddish brown (2.5YR 4/4) extremely channery silt loam; massive; friable; few roots; about 75 percent rock fragments; very strongly acid; gradual wavy boundary.

R—24 inches; reddish brown (2.5YR 4/4), fractured siltstone.

The thickness of the solum ranges from 18 to 35 inches. The depth to bedrock ranges from 20 to 40 inches. The content of shale, siltstone, and sandstone fragments ranges from 15 to 25 percent, by volume, in the A horizon, from 20 to 55 percent in individual subhorizons of the B horizon, and from 50 to 80 percent in the C horizon. Reaction is strongly acid or very strongly acid throughout.

The A horizon has hue of 7.5YR or 5YR and value and chroma of 2 to 4. The B horizon has hue of 5YR to 10R, value of 4 or 5, and chroma of 3 to 6. In the fine-earth fraction, it is silt loam, loam, or silty clay loam. It has weak or moderate, fine or medium, subangular blocky structure and is friable.

The C horizon has hue of 10R or 2.5YR, value of 3 or 4, and chroma of 2 to 4. In the fine-earth fraction, it is silt loam or loam. It is friable.

Caneyville Series

The Caneyville series consists of moderately deep, well drained soils that formed in limy material weathered from calcareous shale or limestone. These soils are in the area between North Fork Mountain and River Knobs, east of the North Fork of the South Branch of the Potomac River. They are on uplands in the Valley and Ridge Physiographic Province. Slope ranges from 8 to 55 percent.

Caneyville soils generally are near the well drained Opequon soils, the moderately well drained Clarksburg soils, and the somewhat poorly drained Toms soils. They are deeper over bedrock than Opequon soils. They are shallower over bedrock than Clarksburg and Toms soils.

Typical pedon of Caneyville silty clay loam, in an area of Opequon-Caneyville silty clay loams, 25 to 35 percent slopes, severely eroded; in a Forest Service grazing allotment 0.6 mile east of Harper Knob, 150 yards northwest of power pole number KT 484, 1.25 miles south of Seneca Rocks:

Ap—0 to 3 inches; brown (10YR 4/3) silty clay loam; moderate medium and coarse granular structure; friable; many roots; about 2 percent rock fragments; neutral; clear wavy boundary.

Bt1—3 to 9 inches; brown (7.5YR 4/4) silty clay loam; moderate fine and medium subangular blocky structure; friable; common distinct clay films on faces of peds; common roots; about 2 percent rock fragments; neutral; clear wavy boundary.

Bt2—9 to 18 inches; brown (7.5YR 4/4) silty clay; strong medium prismatic structure parting to moderate medium angular blocky; firm; common distinct clay films on faces of peds; common roots; about 2 percent rock fragments; neutral; clear wavy boundary.

Bt3—18 to 23 inches; yellowish red (5YR 5/6) silty clay; brown (7.5YR 4/4) and dark brown (7.5YR 3/2) coatings on peds; moderate fine and medium angular blocky structure; firm; common distinct clay films on faces of peds; few roots; about 2 percent rock fragments; mildly alkaline; clear irregular boundary.

C—23 to 34 inches; mixed dark brown (7.5YR 3/2) and brown (7.5YR 4/4) very channery silty clay; massive; friable to firm; few roots; about 50 percent rock fragments; mildly alkaline.

R—34 inches; fractured, shaly limestone.

The thickness of the solum and the depth to bedrock range from 20 to 40 inches. The content of limestone and shale fragments ranges from 0 to 10 percent in the solum and from 15 to 70 percent in the C horizon. Reaction is slightly acid or neutral in the upper part of the solum and slightly acid to mildly alkaline in the lower part of the solum and in the C horizon.

The Ap horizon has hue of 10YR or 7.5YR, value of 4, and chroma of 2 to 4. The Bt horizon has hue of 5YR or 7.5YR, value of 4 or 5, and chroma of 4 to 6. It is silty clay, clay, or silty clay loam. It has moderate, fine or medium, angular blocky structure and is friable or firm.

The C horizon has hue of 5YR to 10YR, value of 3 to 5, and chroma of 2 to 6. In the fine-earth fraction, it is silty clay or clay.

Cateache Series

The Cateache series consists of moderately deep, well drained soils that formed in residuum derived mainly from interbedded siltstone and shale. These soils are on uplands west of the North Fork of the South Branch of the Potomac River. Slope ranges from 3 to 80 percent.

The Cateache soils generally are near the Belmont and Shouns soils. They are shallower over bedrock and have more rock fragments in the C horizon than the Belmont soils. They are shallower over bedrock than the Shouns soils.

Typical pedon of Cateache silt loam, in an area of Belmont-Cateache silt loams, 15 to 25 percent slopes; in a pasture near the headwaters of Back Run, 100 yards south of a drainage divide, 30 yards west of a wooded area:

Ap—0 to 3 inches; dark brown (7.5YR 3/2) silt loam; weak fine granular structure; very friable; many roots; about 5 percent rock fragments; strongly acid; abrupt smooth boundary.

BA—3 to 8 inches; dark reddish brown (5YR 3/4) silt loam; weak medium subangular blocky structure; friable; common roots; about 5 percent rock fragments; strongly acid; clear wavy boundary.

Bt1—8 to 16 inches; reddish brown (5YR 4/4) channery silt loam; weak fine and medium subangular blocky structure; friable; common roots; few faint clay films on faces of peds; about 15 percent rock fragments; very strongly acid; clear wavy boundary.

Bt2—16 to 20 inches; reddish brown (5YR 4/4) channery silt loam; weak fine subangular blocky structure; friable; few roots; few faint clay films on faces of peds; about 25 percent rock fragments; very strongly acid; clear wavy boundary.

C—20 to 25 inches; reddish brown (5YR 4/4) extremely channery silt loam; massive; friable; few roots; about 70 percent rock fragments; strongly acid; clear wavy boundary.

R—25 inches; reddish brown (5YR 4/4), fractured siltstone.

The thickness of the solum ranges from 18 to 40 inches. The depth to bedrock ranges from 20 to 40 inches. The content of siltstone, shale, and fine-grained sandstone fragments ranges from 5 to 25 percent, by volume, in the A and BA horizons, from 10 to 40 percent in the Bt horizon, and from 35 to 80 percent in the C horizon. Reaction ranges from very strongly acid to moderately acid in the A and B horizons and strongly acid to moderately acid in the C horizon.

The A horizon has hue of 10YR to 5YR, value of 2 or 3, and chroma of 2. The BA horizon has hue of 5YR, value of 3 or 4, and chroma of 2 to 4. In the fine-earth fraction, it is silt loam or loam.

The Bt horizon has hue of 5YR or 2.5YR, value of 3 or 4, and chroma of 3 to 6. It is silt loam or silty clay loam. It has weak or moderate, fine or medium, subangular blocky structure.

The C horizon has hue of 5YR to 10R and value and chroma of 3 or 4. It is silt loam or silty clay loam.

Chagrin Series

The Chagrin series consists of very deep, well drained soils that formed in alluvial material. These soils are on flood plains in the Valley and Ridge Physiographic Province. Slope ranges from 0 to 3 percent.

Chagrin soils generally are near the somewhat excessively drained Potomac soils, the well drained Tioga soils, and the moderately well drained Lobdell soils. They have fewer rock fragments and less sand in the upper 40 inches than Potomac soils. They have more clay in the control section than Tioga and Potomac soils.

Typical pedon of Chagrin loam, in a crop field; ¼ mile south of the intersection of U.S. Route 33 and Bolton Road:

Ap1—0 to 6 inches; very dark grayish brown (10YR 3/2) loam, light brownish gray (10YR 6/2) dry; weak medium granular structure; friable; many roots; about 5 percent rock fragments; moderately acid; clear wavy boundary.

Ap2—6 to 12 inches; very dark grayish brown (10YR 3/2) loam, light brownish gray (10YR 6/2) dry; weak fine subangular blocky structure parting to moderate fine and medium granular; friable; common roots;

about 5 percent rock fragments; moderately acid; clear wavy boundary.

Bw—12 to 26 inches; dark brown (10YR 3/3) loam, pale brown (10YR 6/3) dry; weak medium subangular blocky structure; friable; common roots; about 5 percent rock fragments; slightly acid; gradual wavy boundary.

C1—26 to 43 inches; dark brown (10YR 3/3) fine sandy loam, pale brown (10YR 6/3) dry; massive; friable; common roots; about 5 percent rock fragments; slightly acid; clear wavy boundary.

C2—43 to 65 inches; brown (10YR 4/3) very gravelly sandy loam; massive; very friable; few roots; about 45 percent rock fragments; slightly acid.

The thickness of the solum ranges from 24 to 48 inches. The depth to bedrock is more than 60 inches. The content of gravel ranges from 0 to 10 percent in the A horizon and from 0 to 15 percent in the B horizon and in the part of the C horizon above a depth of 40 inches. The part of the C horizon below a depth of 40 inches has a rock fragment content of 10 to 50 percent. Reaction ranges from moderately acid to neutral.

The A horizon has hue of 10YR, value of 2 to 4, and chroma of 2 or 3. The Bw horizon has hue of 10YR or 7.5YR and value and chroma of 3 or 4. It is dominantly loam or silt loam but includes thin subhorizons of fine sandy loam or silty clay loam. It has weak, medium to coarse, subangular blocky structure and is friable.

The C horizon has hue of 10YR or 7.5YR, value of 3 to 5, and chroma of 2 to 4. It is loam, silt loam, fine sandy loam, or sandy loam. Some pedons are gravelly or very gravelly below a depth of 40 inches. This horizon is friable or very friable.

Clarksburg Series

The Clarksburg series consists of very deep, moderately well drained soils that formed in colluvial material. These soils are on uplands in the Valley and Ridge Physiographic Province. Slope ranges from 3 to 25 percent.

Clarksburg soils generally are near the well drained Berks, Caneyville, and Edom soils and the somewhat poorly drained Toms soils. They have a fragipan, which is not characteristic of Berks, Caneyville, Edom, and Toms soils. They also are deeper over bedrock and have fewer rock fragments in the solum than Berks soils. Clarksburg soils have less clay in the B horizon than Caneyville, Edom, or Toms soils.

Typical pedon of Clarksburg channery silt loam, 3 to 15 percent slopes, stony; near the community of Deer Run, 0.3 mile north of the intersection of County Roads 12/1 and 16:

Ap—0 to 6 inches; dark grayish brown (10YR 4/2) channery silt loam; weak fine granular structure; friable; many roots; about 15 percent rock fragments; slightly acid; abrupt smooth boundary.

BA—6 to 9 inches; yellowish brown (10YR 5/6) channery silt loam; moderate medium subangular blocky structure; friable; many roots; about 15 percent rock fragments; slightly acid; clear wavy boundary.

Bt1—9 to 17 inches; strong brown (7.5YR 5/6) channery silt loam; moderate fine and medium subangular blocky structure; friable; few faint clay films on faces of peds; few roots; about 20 percent rock fragments; moderately acid; clear wavy boundary.

Bt2—17 to 23 inches; strong brown (7.5YR 5/6) channery silty clay loam; moderate medium subangular blocky structure; friable; few faint clay films on faces of peds; few roots; about 25 percent rock fragments; moderately acid; clear wavy boundary.

Btx—23 to 43 inches; yellowish red (5YR 5/6) channery silty clay loam; many coarse distinct yellowish brown (10YR 5/6), pale brown (10YR 6/3), and light gray (10YR 7/2) mottles; moderate very coarse prismatic structure parting to moderate medium subangular blocky; very firm or firm, and brittle; common prominent clay films on faces of prisms; about 30 percent rock fragments; strongly acid; clear wavy boundary.

C—43 to 65 inches; strong brown (7.5YR 5/6) very channery silty clay loam; many coarse distinct light gray (2.5Y 7/2) and red (2.5YR 5/6) mottles; massive; friable; about 35 percent rock fragments; strongly acid.

The thickness of the solum ranges from 40 to 70 inches. The depth to bedrock is more than 60 inches. Rock fragments range from 0 to 25 percent in the horizons above the fragipan, from 5 to 30 percent in the fragipan, and from 5 to 50 percent in the C horizon. Reaction ranges from slightly acid to strongly acid.

The A horizon has hue of 10YR, value of 4 or 5, and chroma of 2 or 3. The BA and Bt horizons have hue of 7.5YR or 10YR, value of 4 or 5, and chroma of 4 to 8. In the fine-earth fraction, they are silty clay loam, silt loam, loam, or clay loam. They have weak or moderate, fine or medium, subangular blocky structure and are friable.

The Btx horizon has hue of 5YR to 10YR, value of 4 or 5, and chroma of 3 to 6. In the fine-earth fraction, it is silt loam, loam, silty clay loam, or clay loam. It has moderate, very coarse, prismatic structure parting to thick or medium platy or fine or medium subangular blocky. It is firm or very firm.

The C horizon has hue of 10YR or 7.5YR, value of 4 or 5, and chroma of 4 to 8. In the fine-earth fraction, it is silt loam, loam, clay loam, silty clay loam, or clay. It is friable or firm.

Dekalb Series

The Dekalb series consists of moderately deep, well drained soils that formed in acid material weathered mainly from sandstone. These soils are on uplands in the Valley and Ridge Physiographic Province and along the eastern slopes of Allegheny Mountain. Slope ranges from 3 to 80 percent.

Dekalb soils generally are near the well drained Blackthorn, Calvin, Elliber, Hazleton, Laidig, and Lehew soils and the moderately well drained Buchanan soils. They are shallower over bedrock than Blackthorn, Elliber, Hazleton, Laidig, and Buchanan soils. They have more rock fragments in the B horizon and do not have a fragipan, which is characteristic of Laidig and Buchanan soils. They do not have the reddish brown color in the B and C horizons that is characteristic of Calvin and Lehew soils. Dekalb soils have less clay in the subsoil than Blackthorn soils.

Typical pedon of Dekalb very channery sandy loam, in an area of Hazleton-Dekalb complex, 15 to 35 percent slopes, stony; 10 feet north of Route 1/1, 4.5 miles east of its intersection with Route 1:

Oi—2 inches to 1 inch; partially decomposed hardwood leaf litter and pine needles.

Oe—1 inch to 0; decomposed hardwood leaf litter.

A—0 to 1 inch; very dark gray (10YR 3/1) very channery sandy loam; weak fine granular structure; friable; many roots; about 40 percent rock fragments; very strongly acid; abrupt wavy boundary.

E—1 to 3 inches; grayish brown (10YR 5/2) very channery sandy loam; weak fine granular structure; friable; many roots; about 40 percent rock fragments; very strongly acid; clear wavy boundary.

BE—3 to 9 inches; yellowish brown (10YR 5/4) channery sandy loam; many coarse yellowish brown (10YR 5/6) mottles; weak fine and medium subangular blocky structure; friable; many roots; about 20 percent rock fragments; very strongly acid; clear wavy boundary.

Bw1—9 to 14 inches; yellowish brown (10YR 5/4) channery sandy loam; moderate medium subangular blocky structure; friable; many roots; about 30 percent rock fragments; very strongly acid; clear wavy boundary.

Bw2—14 to 27 inches; yellowish brown (10YR 5/4) very channery sandy loam; moderate coarse subangular blocky structure; friable; few roots; about 40 percent rock fragments; very strongly acid; abrupt irregular boundary.

R—27 inches; fractured sandstone; some weathered material in cracks.

The thickness of the solum and the depth to bedrock range from 20 to 40 inches. The content of rock fragments, primarily sandstone and occasionally siltstone or chert, ranges from 10 to 60 percent in the solum and from 50 to 80 percent in the C horizon. Reaction ranges from extremely acid to strongly acid.

The A horizon has hue of 10YR, value of 2 to 4, and chroma of 0 to 4. The E horizon has hue of 10YR, value of 5 or 6, and chroma of 2 to 4. In the fine-earth fraction, it is loam or sandy loam.

The BE and Bw horizons have hue of 10YR or 7.5YR, value of 5 or 6, and chroma of 4 to 8. In the fine-earth fraction, they are loam, fine sandy loam, or sandy loam. They have weak or moderate, fine to coarse, subangular blocky structure and are friable.

The C horizon has hue of 10YR or 7.5YR, value of 5, and chroma of 4 to 6. In the fine-earth fraction, it is sandy loam or loamy sand. It is friable to loose.

Dunning Series

The Dunning series consists of very deep, very poorly drained or poorly drained soils that formed in alluvial material. These soils are on flood plains in the Valley and Ridge Physiographic Province. Slope ranges from 0 to 3 percent.

Dunning soils generally are near the well drained Massanetta soils, the moderately well drained Lobdell soils, and the somewhat poorly drained Orrville soils. They have more clay in the B horizon than any of those soils. Dunning soils do not have the marl substratum that is characteristic of Massanetta soils.

Typical pedon of Dunning silt loam; 400 feet southeast of Christ Central Church, about 1.85 miles south of the intersection of Route 11 and U.S. Highway 220, in Upper Tract:

Ap—0 to 8 inches; black (10YR 2/1) silt loam; very dark gray (10YR 3/1) dry; moderate medium granular structure; friable; few roots; neutral; abrupt smooth boundary.

Ag—8 to 16 inches; black (10YR 2/1) silty clay loam; very dark gray (10YR 3/1) dry; moderate medium subangular blocky structure; friable; few roots; neutral; clear wavy boundary.

Bg1—16 to 21 inches; dark gray (10YR 4/1) silty clay;

moderate fine and medium subangular blocky structure; friable; few roots; neutral; clear wavy boundary.

Bg2—21 to 36 inches; gray (10YR 5/1) clay; many yellowish brown (10YR 5/8) and few light gray (10YR 6/1) mottles; weak coarse prismatic structure; firm; few roots; neutral; clear wavy boundary.

Cg1—36 to 46 inches; light gray (10YR 6/1) silty clay loam; many brownish yellow (10YR 6/6) mottles; massive; firm; few roots; about 5 percent rock fragments; neutral; clear wavy boundary.

Cg2—46 to 65 inches; light gray (N 6/0) gravelly silty clay loam; many yellowish brown (10YR 5/6) mottles; massive; firm; about 15 percent rock fragments; neutral.

The thickness of the solum ranges from 30 to 50 inches. The depth to bedrock is more than 60 inches. Rock fragment content ranges from 0 to 5 percent in the solum and from 0 to 30 percent in the C horizon. Reaction ranges from moderately acid to mildly alkaline.

The A and Ag horizons are neutral in hue or have hue of 10YR or 2.5Y. They have value of 2 or 3 and chroma of 0 to 3.

The B horizon is neutral in hue or has hue of 2.5Y or 10YR. It has value of 4 to 6 and chroma of 0 to 2. In the fine-earth fraction, it is silty clay loam, silty clay, or clay. It has weak to strong, fine to coarse, angular blocky, subangular blocky, or prismatic structure. It is firm or friable.

The C horizon is neutral in hue or has hue of 2.5Y or 10YR. It has value of 4 to 6 and chroma of 0 to 2. In the fine-earth fraction, it is silty clay loam, silty clay, or clay. Some pedons have stratified layers of silt loam, loam, sandy loam, or their gravelly analogs below a depth of 40 inches. The horizon is friable or firm.

Edom Series

The Edom series consists of deep, well drained soils that formed in material weathered from calcareous shale or limestone. These soils are on uplands in the Valley and Ridge Physiographic Province. Slope ranges from 8 to 55 percent.

Edom soils generally are near the well drained Opequon soils, the moderately well drained Clarksburg soils, and the somewhat poorly drained Toms soils. They are deeper than Opequon soils. They have more clay in the B horizon than Clarksburg soils, and they are not as deep as Clarksburg and Toms soils.

Typical pedon of Edom channery silt loam, 25 to 35 percent slopes, in a pasture; 2,000 feet north of U.S. Route 33, 3.4 miles west of its intersection with U.S. Route 220, in Franklin:

Ap—0 to 6 inches; brown (7.5YR 4/4) channery silt loam; weak fine granular structure; friable; few roots; about 15 percent rock fragments; neutral; clear wavy boundary.

Bt1—6 to 10 inches; yellowish red (5YR 5/6) silty clay loam; moderate medium subangular blocky structure; friable; few faint clay films; few roots; about 10 percent rock fragments; slightly acid; clear wavy boundary.

Bt2—10 to 20 inches; yellowish red (5YR 5/6) channery silty clay; strong fine and medium subangular blocky structure; friable; common distinct clay films on faces of peds; few roots; about 15 percent rock fragments; moderately acid; clear wavy boundary.

BC—20 to 30 inches; yellowish red (5YR 4/6) channery silty clay; moderate fine subangular blocky structure; friable; common distinct clay films on faces of peds; few roots; about 15 percent rock fragments; moderately acid; clear wavy boundary.

C—30 to 42 inches; reddish brown (5YR 4/4) channery silty clay loam; layers of dark reddish brown (5YR 3/2) and brown (10YR 5/3) weathered parent material; massive; friable; about 30 percent rock fragments; neutral; abrupt irregular boundary.

R—42 inches; interbedded shale and limestone.

The thickness of the solum ranges from 20 to 40 inches. The depth to bedrock ranges from 40 to 60 inches. The content of limestone and shale fragments ranges from 0 to 30 percent in the solum and from 20 to 80 percent in the C horizon. Reaction ranges from strongly acid to neutral in the upper part of the solum and from moderately acid to mildly alkaline in the lower part and in the C horizon.

The A horizon has hue of 10YR or 7.5YR, value of 3 or 4, and chroma of 2 to 4. The B horizon has hue of 5YR or 7.5YR, value of 4 or 5, and chroma of 3 to 6. In the fine-earth fraction, it is silty clay, clay, or silty clay loam. It has weak to strong, fine or medium, subangular or angular blocky structure and is friable to firm.

The C horizon has hue of 5YR to 10YR, value of 4 or 5, and chroma of 2 to 6. In the fine-earth fraction, it is silty clay loam, silty clay, or clay. It is friable to firm.

Elliber Series

The Elliber series consists of very deep, well drained soils that formed in material weathered from chert. These soils are on uplands in the Valley and Ridge Physiographic Province. Slope ranges from 3 to 80 percent.

Elliber soils generally are near the well drained Dekalb, Blackthorn, and Opequon soils. They are deeper over bedrock than Dekalb and Opequon soils, and they have more rock fragments and less clay in the subsoil than Opequon soils. Elliber soils contain less clay in the lower part of the solum than Blackthorn soils.

Typical pedon of Elliber extremely channery loam, in an area of Blackthorn-Dekalb-Elliber association, 15 to 35 percent slopes, stony; about 150 yards east of Route 14/1, 0.45 mile north of its intersection with Route 14:

A—0 to 4 inches; very dark gray (10YR 3/1) extremely channery loam; weak fine granular structure; friable; many roots; about 80 percent rock fragments; very strongly acid; clear wavy boundary.

E—4 to 9 inches; light brownish gray (10YR 6/2) extremely channery sandy loam; weak fine granular structure; friable; common roots; about 80 percent rock fragments; very strongly acid; abrupt wavy boundary.

BE—9 to 15 inches; brownish yellow (10YR 6/6) extremely channery loam; weak fine granular structure; friable; common roots; about 80 percent rock fragments; strongly acid; clear wavy boundary.

Bw—15 to 25 inches; light yellowish brown (10YR 6/4) extremely channery loam; weak fine subangular blocky structure; friable; common roots; about 80 percent rock fragments; strongly acid; gradual wavy boundary.

Bt1—25 to 40 inches; light yellowish brown (10YR 6/4) extremely channery loam; weak medium subangular blocky structure; friable; few faint clay films on faces of peds and on chert fragments; few roots; about 60 percent rock fragments; strongly acid; gradual wavy boundary.

Bt2—40 to 65 inches; light yellowish brown (10YR 6/4) extremely channery loam; pockets of silt and very fine sand; weak medium subangular blocky structure; friable; common faint clay films in pores and on chert fragments; about 60 percent rock fragments; strongly acid.

The thickness of the solum ranges from 40 to 80 inches. The depth to bedrock is more than 60 inches. The content of rock fragments, primarily chert and some sandstone, ranges from 40 to 80 percent, by volume, throughout. Reaction ranges from extremely acid to strongly acid.

The A horizon has hue of 10YR, value of 2 to 3, and chroma of 1 or 2. The E horizon has hue of 10YR, value of 6 or 7, and chroma of 2 or 4. In the fine-earth fraction, it is loam, sandy loam, or silt loam.

The BE, Bw, and Bt horizons have hue of 10YR or 7.5YR, value of 5 or 6, and chroma of 4 to 8. In the fine-earth fraction, they are dominantly loam or silt loam but subhorizons are sandy loam in some pedons. The BE horizon has weak fine granular or weak fine subangular blocky structure. The Bw and Bt horizons have weak or moderate, fine or medium, subangular blocky structure. They are loose to firm.

The C horizon has hue of 10YR or 7.5YR, value of 5 or 6, and chroma of 3 to 6. In the fine-earth fraction, it is loam, silt loam, or sandy loam. It is loose to firm.

Ernest Series

The Ernest series consists of very deep, moderately well drained soils that formed in acid colluvial material derived mainly from soils underlain by shale and siltstone. These soils are on uplands in the Valley and Ridge Physiographic Province. Slope ranges from 3 to 25 percent.

Ernest soils generally are near the well drained Berks and Weikert soils, the moderately well drained Clarksburg and Monongahela soils, and the somewhat poorly drained Toms soils. They are deeper over bedrock than Berks and Weikert soils. They are less clayey in the subsoil than Toms soils. They have gray mottles closer to the surface in the B2t horizon than Clarksburg and Monongahela soils. Ernest soils also are more acid in the subsoil than Clarksburg and Toms soils.

Typical pedon of Ernest silt loam, 8 to 15 percent slopes, in a plantation of eastern white pine; 200 feet west of Route 21 and 3.6 miles north of the South Fork Bridge at Fort Seybert:

Ap—0 to 7 inches; dark yellowish brown (10YR 4/4) silt loam; moderate medium granular structure; friable; many roots; about 5 percent rock fragments; strongly acid; clear wavy boundary.

BA—7 to 15 inches; dark yellowish brown (10YR 4/4) silt loam; weak fine and medium subangular blocky structure; friable; common roots; about 5 percent rock fragments; strongly acid; clear wavy boundary.

Bt—15 to 24 inches; brown (10YR 4/3) silt loam; common light brownish gray (10YR 6/2) mottles; moderate medium subangular blocky structure; friable; common roots; few faint clay films on faces of peds; about 5 percent rock fragments; strongly acid; clear wavy boundary.

Btx1—24 to 36 inches; brown (10YR 4/3) silt loam; common grayish brown (10YR 5/2) and few reddish brown (5YR 4/4) mottles; weak very coarse prismatic structure parting to weak fine subangular blocky; very firm and brittle; few roots; common prominent clay films on faces of prisms; about 5 percent rock fragments; strongly acid; abrupt wavy boundary.

Btx2—36 to 45 inches; yellowish brown (10YR 5/4) silt loam; common light brownish gray (10YR 6/2) and reddish brown (5YR 5/4) mottles; weak very coarse prismatic structure parting to weak fine subangular blocky; very firm and brittle; few roots; common prominent clay films on faces of prisms; about 5 percent rock fragments; very strongly acid; gradual wavy boundary.

C—45 to 65 inches; dark grayish brown (10YR 4/2) silty clay loam; common reddish brown (5YR 5/4) mottles; massive; firm; about 5 percent rock fragments; very strongly acid.

The thickness of the solum ranges from 36 to 60 inches. The depth to bedrock is more than 5 feet. The content of rock fragments, mainly shale and siltstone, ranges from 0 to 15 percent in the A horizon, from 5 to 25 percent in the B horizon, and from 5 to 40 percent in the C horizon. Reaction is strongly acid or very strongly acid.

The Ap horizon has hue of 10YR, value of 4 or 5, and chroma of 2 to 4. The BA and Bt horizons have hue of 10YR or 7.5YR, value of 4 to 6, and chroma of 3 to 8. In the fine-earth fraction, they are silt loam or silty clay loam. They have weak or moderate, fine to coarse, subangular blocky structure and are friable or firm.

The Btx horizon has hue of 10YR or 7.5YR, value of 4 to 6, and chroma of 2 to 8. In the fine-earth fraction, it is silt loam, silty clay loam, clay loam, or loam. It has weak, very coarse, prismatic structure parting to weak, fine or medium, subangular blocky. It is firm or very firm.

The C horizon has hue of 7.5YR to 2.5Y, value of 4 to 7, and chroma of 2 to 6. In the fine-earth fraction, it is silt loam, silty clay loam, loam, clay loam, and occasionally silty clay.

Gauley Series

The Gauley series consists of moderately deep, well drained soils that formed in acid material weathered mainly from sandstone. These soils are on uplands in the Appalachian Plateaus Physiographic Province and on top of Spruce Mountain. Slope ranges from 3 to 80 percent.

Gauley soils generally are near the well drained Mandy soils, the moderately well drained Simoda soils, and the poorly drained Trussel soils. They do not have a fragipan, which is characteristic of Simoda and Trussel soils. Gauley soils are shallower over bedrock than Simoda and Trussel soils. They have a spodic horizon, which is not characteristic of Mandy, Simoda, or Trussel soils.

Typical pedon of Gauley channery loam, 3 to 15 percent slopes, rubbly; 0.4 mile southwest of Spruce Knob lookout tower, 5 feet west of U.S. Forest Service Route 103, 0.4 mile northeast of its intersection with Spruce Knob access road:

Oi—1.0 to 0.5 inch; partially decomposed spruce needles and hardwood leaf litter.

Oe—0.5 inch to 0; decomposed spruce needles and hardwood leaf litter.

A—0 to 3 inches; black (10YR 2/1) channery loam; weak medium granular structure; very friable; many roots; about 30 percent rock fragments; very strongly acid; abrupt wavy boundary.

E—3 to 6 inches; dark grayish brown (10YR 4/2) very channery loam; weak thin platy structure parting to weak fine granular; friable; common roots; about 35 percent rock fragments; very strongly acid; abrupt wavy boundary.

Bh—6 to 8 inches; dark reddish brown (5YR 3/2) very channery loam; weak medium platy structure parting to weak fine subangular blocky; friable; common roots; about 35 percent rock fragments; very strongly acid; abrupt wavy boundary.

Bhs—8 to 18 inches; reddish brown (5YR 4/4) and dark reddish brown (5YR 3/2) very channery loam; weak medium subangular blocky structure; friable; common roots; about 35 percent rock fragments; very strongly acid; clear irregular boundary.

Bs—18 to 30 inches; brown (7.5YR 4/4) extremely channery loam; weak medium subangular blocky structure; friable; few roots; about 70 percent rock fragments; very strongly acid; abrupt irregular boundary.

R—30 inches; fractured, gray sandstone.

The thickness of the solum and the depth to bedrock range from 20 to 40 inches. The content of rock fragments ranges from 20 to 85 percent, by volume, in individual horizons. Reaction ranges from extremely acid to strongly acid.

The A horizon has hue of 10YR or is neutral in hue. It has value of 2 and chroma of 0 to 1. The E horizon has hue of 10YR to 5YR, value of 4 to 6, and chroma of 1 or 2. In the fine-earth fraction, it is loam, sandy loam, or loamy sand.

The Bh and Bhs horizons have hue of 5YR to 10YR, value of 2 to 4, and chroma of 1 to 4. In the fine-earth fraction, they are loam or sandy loam. They have weak, fine or medium, granular or subangular blocky or weak, thin or medium, platy structure. They are friable.

The Bs horizon has hue of 7.5YR or 10YR, value of

5 or 6, and chroma of 4 to 8. In the fine-earth fraction, it is loam or sandy loam. It has weak, fine to coarse, subangular blocky structure. It is friable or firm. Some pedons have a C horizon. This horizon has hue of 10YR or 7.5YR and value and chroma of 4 to 6. In the fine-earth fraction, it is loam, sandy loam, or loamy sand. It is friable to firm.

Hazleton Series

The Hazleton series consists of deep and very deep, well drained soils that formed in acid material derived mostly from sandstone. These soils are on uplands in the Valley and Ridge Physiographic Province and along the eastern slopes of Allegheny Mountain. Slope ranges from 3 to 80 percent.

Hazleton soils generally are near the well drained Calvin, Dekalb, Laidig, and Lehew soils and the moderately well drained Buchanan soils. They are deeper over bedrock than Calvin, Dekalb, and Lehew soils. They do not have a fragipan, which is characteristic of Laidig and Buchanan soils. Hazleton soils do not have the reddish brown color in the subsoil that is characteristic of Calvin and Lehew soils.

Typical pedon of Hazleton channery sandy loam, in a wooded area of Hazleton-Dekalb complex, 15 to 35 percent slopes, stony; 10 feet north of Route 1/1, 4.5 miles east of its junction with Route 1:

Oi—1 inch to 0; moss, lichens, and leaf litter.

A—0 to 1 inch; dark grayish brown (10YR 4/2) channery sandy loam; weak fine granular structure; friable; many roots; about 15 percent rock fragments; very strongly acid; abrupt wavy boundary.

E—1 to 5 inches; yellowish brown (10YR 5/4) channery sandy loam; weak fine granular structure; friable; about 25 percent rock fragments; very strongly acid; clear wavy boundary.

BE—5 to 13 inches; yellowish brown (10YR 5/4) very channery sandy loam; weak medium subangular blocky structure parting to weak fine granular; friable; many roots; about 40 percent rock fragments; very strongly acid; gradual wavy boundary.

Bw—13 to 35 inches; yellowish brown (10YR 5/6) very channery sandy loam; weak medium and coarse subangular blocky structure; friable; many roots; about 50 percent rock fragments; very strongly acid; abrupt wavy boundary.

C—35 to 65 inches; yellowish brown (10YR 5/4) extremely channery loamy sand; pockets of yellowish red (5YR 5/6), strong brown (7.5YR 5/6), very pale brown (10YR 7/3), and brownish yellow (10YR 6/6) sandy loam; single grain; loose; about 75 percent rock fragments; very strongly acid.

The thickness of the solum ranges from 25 to 50 inches. The depth to bedrock is 40 to 72 inches or more. The content of rock fragments, mainly sandstone and occasionally siltstone or chert, ranges from 15 to 70 percent in the solum and from 35 to 80 percent in the C horizon. Reaction ranges from strongly acid to extremely acid throughout.

The A horizon has hue of 10YR, value of 2 to 4, and chroma of 1 or 2. The E horizon has hue of 10YR, value of 4 or 5, and chroma of 1 to 4. In the fine-earth fraction, it is sandy loam or loam.

The BE and Bw horizons have hue of 10YR or 7.5YR and value and chroma of 3 to 6. In the fine-earth fraction, they are sandy loam or loam. They have weak or moderate, fine to coarse, subangular blocky structure and are very friable to firm.

The C horizon has hue of 10YR to 5YR and value and chroma of 3 to 6. In the fine-earth fraction, it is sandy loam, loam, fine sandy loam, or loamy sand. It is loose to friable.

Laidig Series

The Laidig series consists of very deep, well drained soils that formed in acid colluvial material. These soils are on uplands in the Valley and Ridge Physiographic Province and on the Appalachian Plateau. Slope ranges from 3 to 55 percent.

Laidig soils generally are near the well drained Dekalb and Hazleton soils and the moderately well drained Buchanan soils. They have a fragipan, which is not characteristic of Dekalb or Hazleton soils. They have low-chroma mottles below the upper 10 inches of the argillic horizon, which is not characteristic of Buchanan series. They are deeper over bedrock than Dekalb soils.

Typical pedon of Laidig channery loam, in a wooded area of Laidig and Buchanan soils, 3 to 15 percent slopes, stony; along the west side of Route 14/1, 0.4 mile north of its intersection with Route 14:

A—0 to 1 inch; dark grayish brown (10YR 4/2) channery loam; weak fine granular structure; friable; many roots; about 25 percent rock fragments; very strongly acid; abrupt wavy boundary.

E—1 to 6 inches; light yellowish brown (10YR 6/4) channery loam; weak fine granular structure; friable; many roots; about 20 percent rock fragments; very strongly acid; clear wavy boundary.

BE—6 to 12 inches; light yellowish brown (10YR 6/4) channery loam; weak medium subangular blocky structure; friable; many roots; about 20 percent rock fragments; very strongly acid; clear wavy boundary.

Bt1—12 to 20 inches; brownish yellow (10YR 6/6) channery loam; moderate fine and medium subangular blocky structure; friable; few faint clay films on faces of peds; few roots; about 25 percent rock fragments; very strongly acid; clear wavy boundary.

Bt2—20 to 30 inches; light yellowish brown (10YR 6/4) channery sandy loam; moderate medium subangular blocky structure; friable; few faint clay films on faces of peds; few roots; about 30 percent rock fragments; very strongly acid; clear wavy boundary.

Bt3—30 to 34 inches; light yellowish brown (10YR 6/4) channery sandy loam; common brownish yellow (10YR 6/8) and light gray (10YR 7/2) mottles; moderate medium subangular blocky structure; friable; few faint clay films on faces of peds; about 25 percent rock fragments; very strongly acid; abrupt wavy boundary.

Btx1—34 to 54 inches; brownish yellow (10YR 6/6) channery sandy loam; common very pale brown (10YR 7/4) mottles and light gray (N 7/0) clay loam faces of prisms; weak very coarse prismatic structure; very firm and brittle; common distinct clay films on faces of prisms; about 20 percent rock fragments; very strongly acid; clear wavy boundary.

Btx2—54 to 65 inches; brownish yellow (10YR 6/6) channery sandy loam; light gray (N 7/0) clay loam faces of prisms; weak very coarse prismatic structure; firm and brittle; common distinct clay films on faces of prisms; about 15 percent rock fragments; very strongly acid.

The thickness of the solum ranges from 60 to more than 80 inches. The depth to bedrock is more than 60 inches. The content of sandstone, shale, and siltstone fragments ranges from 15 to 45 percent above the fragipan, from 15 to 60 percent in the fragipan, and from 20 to 70 percent in the C horizon. Reaction ranges from strongly acid to extremely acid throughout.

The A horizon has hue of 10YR, value of 2 to 5, and chroma of 1 to 4. The E horizon has hue of 10YR or 7.5YR, value of 4 to 6, and chroma of 1 to 6. In the fine-earth fraction, it is loam, sandy loam, or fine sandy loam.

The BE and Bt horizons have hue of 10YR or 7.5YR, value of 4 to 6, and chroma of 3 to 6. In the fine-earth fraction, they are loam, sandy loam, clay loam, or sandy clay loam. They have weak or moderate, fine or medium, subangular blocky structure and are friable.

The Btx horizon has hue of 10YR or 7.5YR, value of 4 to 6, and chroma of 3 to 6. In the fine-earth fraction, it is loam, sandy loam, clay loam, or sandy clay loam. It has weak, very coarse, prismatic structure parting to weak or moderate, fine or medium, subangular blocky or weak or moderate, thin or medium, platy. The horizon is firm or very firm.

The C horizon has hue of 10YR or 7.5YR, value of 5 or 6, and chroma of 3 to 6. In the fine-earth fraction, it is loam, sandy loam, clay loam, or sandy clay loam. It is friable to firm.

Lehew Series

The Lehew series consists of moderately deep, well drained soils that formed in acid material weathered mostly from sandstone. These soils are on uplands in the Valley and Ridge Physiographic Province. Slope ranges from 3 to 80 percent.

Lehew soils generally are near the well drained Calvin, Dekalb, Hazleton, and Shouns soils. They have more sand and less silt throughout than Calvin soils. Lehew soils do not have the yellowish brown or strong brown color in the subsoil that is characteristic of Dekalb or Hazleton soils and are shallower over bedrock than Hazleton and Shouns soils.

Typical pedon of Lehew channery fine sandy loam, in a wooded area of Lehew, Hazleton, and Dekalb soils, 15 to 35 percent slopes, stony; 100 feet east of the crest of North Fork Mountain, 3,000 feet southwest of Harmon Rocks and 1.2 miles southwest of the point where U.S. Route 33 crosses the crest of North Fork Mountain:

A—0 to 1 inch; black (5YR 2/1) channery fine sandy loam; moderate fine granular structure; very friable; many roots; about 25 percent rock fragments; very strongly acid; abrupt wavy boundary.

E—1 to 3 inches; reddish brown (5YR 5/3) channery fine sandy loam; weak fine granular structure; very friable; many roots; about 30 percent rock fragments; very strongly acid; clear wavy boundary.

BE—3 to 9 inches; reddish brown (5YR 4/4) channery fine sandy loam; weak fine subangular blocky structure parting to weak fine granular; friable; many roots; about 30 percent rock fragments; very strongly acid; gradual wavy boundary.

Bw1—9 to 17 inches; reddish brown (5YR 4/4) very channery fine sandy loam; weak fine and medium subangular blocky structure; friable; many roots; about 40 percent rock fragments; very strongly acid; gradual wavy boundary.

Bw2—17 to 30 inches; dark reddish brown (5YR 3/4) channery fine sandy loam; weak fine subangular blocky structure; friable; common roots; about 35 percent rock fragments; very strongly acid; clear wavy boundary.

C—30 to 36 inches; dark reddish brown (5YR 3/4) very channery fine sandy loam; massive; friable; few roots; about 55 percent rock fragments; very strongly acid; abrupt wavy boundary.

R—36 inches; fractured, dark reddish brown (5YR 3/4) sandstone.

The thickness of the solum ranges from 15 to 30 inches. The depth to bedrock ranges from 20 to 40 inches. The content of sandstone and siltstone fragments ranges from 20 to 60 percent in the solum and from 40 to 80 percent in the C horizon. Reaction is strongly acid or very strongly acid throughout.

The A horizon has hue of 5YR to 10YR, value of 2 to 5, and chroma of 1 to 4. The E horizon has hue of 5YR or 7.5YR, value of 5 or 6, and chroma of 2 to 4. In the fine-earth fraction, it is fine sandy loam, loam, or sandy loam.

The BE and Bw horizons have hue of 2.5YR or 5YR, value of 3 to 5, and chroma of 4 to 6. In the fine-earth fraction, they are loam, fine sandy loam, or sandy loam. They have weak or moderate, very fine to medium, subangular blocky structure and are friable or very friable.

The C horizon has hue of 2.5YR or 5YR, value of 3 to 5, and chroma of 2 to 4. In the fine-earth fraction, it is sandy loam, fine sandy loam, or loam. It is friable or very friable.

Lobdell Series

The Lobdell series consists of very deep, moderately well drained soils that formed in limy alluvial material. These soils are on flood plains in the Valley and Ridge Physiographic Province. Slope ranges from 0 to 3 percent.

Lobdell soils generally are near the somewhat excessively drained Potomac soils, the well drained Chagrin, Tioga, and Massanetta soils, the somewhat poorly drained Orrville soils, and the very poorly drained or poorly drained Dunning soils. They have fewer rock fragments and less sand above a depth of 40 inches than Potomac soils. They have more clay in the control section than Tioga soils and less clay in the subsoil than Dunning soils. Lobdell soils do not have the marl substratum that is characteristic of Massanetta soils.

Typical pedon of Lobdell loam, in a pasture; 1.1 miles northeast of Brandywine, 500 feet east of the South Fork of the South Branch of the Potomac River, 650 feet northeast of its confluence with Heavener Run:

Ap—0 to 10 inches; dark brown (10YR 3/3) loam, light brownish gray (10YR 6/2) dry; very dark grayish brown (10YR 3/2) faces of peds; weak medium granular structure; friable; many roots; very slightly acid; clear wavy boundary.

A—10 to 15 inches; dark brown (10YR 3/3) loam, light brownish gray (10YR 6/2) dry; very dark grayish brown (10YR 3/2) faces of peds; weak medium granular structure; friable; common roots; moderately acid; clear wavy boundary.

Bw1—15 to 23 inches; brown (10YR 4/3) loam; few grayish brown (10YR 5/2) mottles; weak fine and medium subangular blocky structure; friable; few roots; moderately acid; clear wavy boundary.

Bw2—23 to 33 inches; brown (10YR 4/3) loam; common grayish brown (10YR 5/2) mottles; weak medium subangular blocky structure; friable; few roots; few black stains; moderately acid; clear wavy boundary.

C—33 to 65 inches; dark yellowish brown (10YR 4/4) sandy loam; many grayish brown (10YR 5/2) mottles; massive; very friable; few roots; few black stains; about 10 percent rock fragments; moderately acid.

The thickness of the solum ranges from 24 to 50 inches. The depth to bedrock is more than 60 inches. The content of gravel ranges from 0 to 5 percent, by volume, in the A horizon and from 0 to 15 percent in the B and C horizons. Reaction ranges from moderately acid to neutral throughout.

The A horizon has hue of 10YR, value of 3 or 4, and chroma of 2 or 3. The B horizon has hue of 10YR or 7.5YR, value of 4 or 5, and chroma of 3 or 4. In the fine-earth fraction, it is loam, silt loam, silty clay loam, or fine sandy loam. It has weak, fine to coarse, subangular blocky structure and is friable.

The C horizon has hue of 10YR, value of 4 to 6, and chroma of 1 to 4. In the fine-earth fraction, it is silt loam, loam, or sandy loam. It is friable or very friable.

Mandy Series

The Mandy series consists of moderately deep, well drained soils that formed in acid material weathered from interbedded siltstone, shale, and sandstone. These soils are on uplands in the Appalachian Plateaus Physiographic Province and on Spruce Mountain. Slope ranges from 8 to 55 percent.

Mandy soils generally are near the well drained Gauley soils, the moderately well drained Simoda soils, and the poorly drained Trussel soils. They are shallower over bedrock than Simoda or Trussel soils. They do not have the spodic horizon that is characteristic of Gauley soils nor the fragipan that is characteristic of Trussel and Simoda soils.

Typical pedon of Mandy channery silt loam, 8 to 15 percent slopes, in a wooded area; about 1.25 miles northeast of Spruce Knob Lake and 10 yards east of U.S. Forest Service Trail Number 532:

Oi—2 inches to 0; leaves and twigs.
A—0 to 2 inches; very dark brown (10YR 2/2) channery silt loam; moderate fine granular structure; very friable; many roots; about 25 percent rock fragments; very strongly acid; abrupt wavy boundary.
BA—2 to 8 inches; brown (7.5YR 4/4) channery silt loam; weak fine subangular blocky structure; friable; many roots; about 25 percent rock fragments; very strongly acid; clear wavy boundary.
Bw1—8 to 14 inches; yellowish brown (10YR 5/4) channery silt loam; weak fine and medium subangular blocky structure; friable; many roots; about 25 percent rock fragments; very strongly acid; clear wavy boundary.
Bw2—14 to 22 inches; yellowish brown (10YR 5/4) very channery silt loam; weak fine and medium subangular blocky structure; friable; many roots; about 35 percent rock fragments; very strongly acid; clear wavy boundary.
C—22 to 25 inches; yellowish brown (10YR 5/4) extremely channery silt loam; few strong brown (7.5YR 5/6) and pale brown (10YR 6/3) mottles; massive; friable; few roots; about 75 percent rock fragments; very strongly acid; clear wavy boundary.
R—25 inches; siltstone and shale.

The thickness of the solum ranges from 20 to 33 inches. The depth to bedrock ranges from 20 to 40 inches. The content of siltstone, shale, and sandstone fragments ranges from 15 to 25 percent in the A and BA horizons, from 20 to 70 percent in the Bw horizon, and from 60 to 90 percent in the C horizon. Reaction ranges from extremely acid to strongly acid throughout.

The A horizon has hue of 10YR or 7.5YR and value and chroma of 2 to 4. The BA horizon has hue of 7.5YR or 10YR, value of 3 or 4, and chroma of 2 to 4. In the fine-earth fraction, it is silt loam or loam.

The Bw horizon has hue of 10YR or 7.5YR, value of 5 or 6, and chroma of 4 to 6. In the fine-earth fraction, it is loam or silt loam. It has weak or moderate, fine or medium, subangular blocky structure. It is friable or firm.

The C horizon has hue of 10YR or 2.5Y, value of 5 or 6, and chroma of 3 to 8. In the fine-earth fraction, it is silt loam or loam. It is friable or firm.

Massanetta Series

The Massanetta series consists of very deep, well drained soils that formed in limy alluvial material. These soils are on flood plains along streams below springs in limestone. They are in the Valley and Ridge Physiographic Province. Slope ranges from 0 to 3 percent.

Massanetta soils generally are near the well drained Opequon soils, the moderately well drained Lobdell soils, the somewhat poorly drained Orrville soils, and the very poorly drained or poorly drained Dunning soils. They have a marl substratum, which is not characteristic of any of those soils. They have less clay in the subsoil than Dunning and Opequon soils.

Typical pedon of Massanetta silt loam, in a pasture; about 25 yards north and 50 yards west of the intersection of Route 14 and Delta Route 10, about 2.25 miles north of Fort Seybert:

Ap—0 to 10 inches; very dark gray (10YR 3/1) silt loam, grayish brown (10YR 5/2) dry; few light gray (10YR 7/2) marl fragments; moderate fine and medium granular structure; friable; many roots; about 2 percent rock fragments; mild effervescence; moderately alkaline; clear wavy boundary.
BA—10 to 14 inches; dark grayish brown (10YR 4/2) and dark yellowish brown (10YR 4/4) loam; common light gray (10YR 7/2) marl fragments; weak fine subangular blocky structure parting to weak medium granular; friable; many roots; about 5 percent rock fragments; strong effervescence; moderately alkaline; clear wavy boundary.
Bw—14 to 31 inches; dark grayish brown (10YR 4/2) loam; thin discontinuous light gray (10YR 7/2) marl layer at a depth of 24 inches; weak medium subangular blocky structure; friable; common roots; about 5 percent rock fragments; strong effervescence; moderately alkaline; clear wavy boundary.
C1—31 to 42 inches; dark grayish brown (10YR 4/2) loam; few yellowish red (5YR 4/6) mottles; common light gray (10YR 7/2) marl fragments; massive; friable; few roots; about 5 percent rock fragments; strong effervescence; moderately alkaline; clear wavy boundary.
2C2—42 to 65 inches; grayish brown (10YR 5/2) loam; few yellowish red (5YR 4/6) mottles; common light gray (10YR 7/2) marl concretions; massive; friable; few roots; about 5 percent rock fragments; strong effervescence; moderately alkaline.

The thickness of the solum ranges from 20 to 40 inches. The depth to bedrock is more than 60 inches. The content of mostly marl concretions ranges from 0 to 10 percent in the solum and from 0 to 30 percent in the C horizon. In most pedons layers of marl are in the lower part of the subsoil or in the substratum. Reaction is mildly alkaline or moderately alkaline throughout.

The Ap horizon has hue of 10YR, value of 3, and chroma of 1 to 3. The BA and Bw horizons have hue of 10YR, value of 3 to 5, and chroma of 1 to 4. In the fine-earth fraction, they are silt loam, loam, silty clay loam, or clay loam. They have weak or moderate, fine to coarse, subangular blocky structure and are friable.

The C horizon has hue of 7.5YR or 10YR, value of 2 to 5, and chroma of 0 to 2. In the fine-earth fraction, it is loam, silt loam, clay loam, or silty clay loam. The 2C horizon ranges to sandy loam. The C and 2C horizons are friable or very friable.

The seasonal high water table in the Massanetta soils in this survey area is slightly lower than defined for the series. This difference does not significantly affect the use and management of the soils.

Monongahela Series

The Monongahela series consists of very deep, moderately well drained soils that formed in acid alluvial material. These soils are on terraces in the Valley and Ridge Physiographic Province, mainly along rivers. Slope ranges from 3 to 15 percent.

Monongahela soils generally are near the well drained Allegheny soils, the moderately well drained Ernest soils, the somewhat poorly drained Tygart soils, and the poorly drained or very poorly drained Purdy soils. They have a fragipan, which is not characteristic of Allegheny, Tygart, or Purdy soils. Monongahela soils have low-chroma mottles deeper in the Bt2 horizon than Ernest soils. Monongahela soils have less clay in the subsoil than Tygart and Purdy soils.

Typical pedon of Monongahela silt loam, 3 to 8 percent slopes, in a pasture; 1.1 miles northeast of Brandywine, 450 feet east of the South Fork of the South Branch of the Potomac River, 1,400 feet north of its confluence with Sugar Run:

Ap—0 to 7 inches; brown (10YR 4/3) silt loam; weak fine and medium granular structure; friable; many roots; neutral; abrupt wavy boundary.

Bt1—7 to 11 inches; brownish yellow (10YR 6/6) silt loam; weak medium subangular blocky structure; friable; few faint clay films on faces of peds; common roots; slightly acid; clear wavy boundary.

Bt2—11 to 17 inches; yellowish brown (10YR 5/6) silt loam; weak medium subangular blocky structure; friable; few faint clay films on faces of peds; common roots; moderately acid; clear wavy boundary.

Bt3—17 to 26 inches; yellowish brown (10YR 5/6) silty clay loam; common dark gray (10YR 4/1) and few light brownish gray (10YR 6/2) mottles; moderate very coarse prismatic structure parting to weak medium platy; friable; common distinct clay films on faces of peds; few roots; strongly acid; clear wavy boundary.

Btx1—26 to 36 inches; yellowish brown (10YR 5/6) silt loam; common light brownish gray (10YR 6/2) mottles; gray (10YR 5/1) and light brownish gray (10YR 6/2) silty clay faces of prisms; strong very coarse prismatic structure parting to weak medium platy; firm or very firm; common clay films on faces of prisms; few roots; common black concretions; strongly acid; clear wavy boundary.

Btx2—36 to 48 inches; strong brown (7.5YR 5/6) cobbly silt loam; common light brownish gray (10YR 6/2) mottles; gray (10YR 5/1) and light brownish gray (10YR 6/2) silty clay faces of prisms; strong very coarse prismatic structure parting to moderate thick platy; very firm; common clay films on faces of prisms; few roots; about 20 percent sandstone cobbles; strongly acid; clear wavy boundary.

Bt—48 to 65 inches; light yellowish brown (10YR 6/4) cobbly loam; common light brownish gray (10YR 6/2) mottles; gray (10YR 5/1) and light brownish gray (10YR 6/2) faces of prisms; moderate very coarse prismatic structure; friable; common clay films on faces of peds; about 20 percent sandstone cobbles; strongly acid.

The thickness of the solum ranges from 40 to 72 inches. The depth to bedrock is more than 60 inches. The content of rock fragments ranges from 0 to 20 percent, by volume, above the fragipan, from 0 to 25 percent in the fragipan, and from 10 to 40 percent in the C horizon. Reaction generally is strongly acid or very strongly acid, but the surface layer is less acid in limed areas.

The A horizon has hue of 10YR, value of 4 or 5, and chroma of 2 to 4. The Bt horizon has hue of 10YR or 7.5YR, value of 4 to 6, and chroma of 4 to 8. In the fine-earth fraction, it is loam, silt loam, silty clay loam, clay loam, or sandy clay loam. It has weak or moderate, fine or medium, subangular blocky structure, but may have moderate, very coarse, prismatic structure directly above the fragipan. It is friable.

The Btx horizon has hue of 7.5YR to 2.5Y, value of 5 or 6, and chroma of 2 to 6. In the fine-earth fraction, it is silt loam, loam, sandy clay loam, or clay loam. It has weak to strong, very coarse, prismatic structure and is firm or very firm.

The C horizon has hue of 7.5YR to 2.5Y, value of 5 to 7, and chroma of 2 to 8. In the fine-earth fraction, it is sandy loam, sandy clay loam, loam, clay loam, silty clay loam, or silt loam. It is friable or firm.

Opequon Series

The Opequon series consists of shallow, well drained soils that formed in material weathered from limestone or limy shale. These soils are on uplands in the Valley and Ridge Physiographic Province. Slope ranges from 3 to 80 percent.

Opequon soils generally are near the well drained Caneyville, Edom, Elliber, Massanetta, and Blackthorn soils. They are shallower over bedrock than any of those soils. They have fewer rock fragments and more clay in the subsoil than Elliber soils and do not have the marl substratum that is characteristic of the Massanetta soils.

Typical pedon of Opequon silt loam, 15 to 35 percent slopes, very rocky, in a pasture on Pond Ridge Mountain; 3,400 feet north-northeast of U.S. Route 33, 3.4 miles west of its intersection with U.S. Route 220, in Franklin:

A—0 to 3 inches; dark brown (10YR 3/3) silt loam; moderate fine granular structure; friable; many roots; about 10 percent rock fragments; mildly alkaline; clear wavy boundary.

Bt1—3 to 8 inches; yellowish red (5YR 4/8) channery silty clay; moderate fine and medium subangular blocky structure; friable, sticky and plastic; few roots; common distinct clay films on faces of peds; about 15 percent rock fragments; mildly alkaline; clear wavy boundary.

Bt2—8 to 14 inches; reddish brown (5YR 4/4) channery silty clay; strong fine and medium subangular blocky structure; firm, sticky and plastic; few roots; common distinct clay films on faces of peds; about 30 percent rock fragments; mildly alkaline; abrupt wavy boundary.

R—14 inches; limestone.

The thickness of the solum and the depth to bedrock range from 12 to 20 inches. The content of rock fragments, mostly limestone and some sandstone, chert, and limy shale, ranges from 0 to 35 percent throughout. Reaction ranges from moderately acid to mildly alkaline.

The A horizon has hue of 10YR to 5YR, value of 3 to 5, and chroma of 1 to 4. The Bt horizon has hue of 2.5YR to 7.5YR, value of 4 or 5, and chroma of 4 to 8. In the fine-earth fraction, it is silty clay loam, silty clay, or clay. It has fine or medium, moderate or strong, angular or subangular blocky structure and is friable or firm.

Orrville Series

The Orrville series consists of very deep, somewhat poorly drained soils that formed in limy alluvial material. These soils are on flood plains in the Valley and Ridge Physiographic Province. Slope ranges from 0 to 3 percent.

Orrville soils generally are near the well drained Tioga and Massanetta soils, the moderately well drained Lobdell soils, and the very poorly drained or poorly drained Dunning soils. They have more clay in the control section than Tioga soils and less clay in the subsoil than Dunning soils. They do not have the marl substratum that is characteristic of Massanetta soils.

Typical pedon of Orrville loam, in a corn field; 1,400 feet south of Franklin High School, 1,100 feet west of the South Branch of the Potomac River:

Ap—0 to 10 inches; dark grayish brown (10YR 4/2) loam; few yellowish red (5YR 4/6) mottles; weak medium granular structure; friable; common roots; about 2 percent rock fragments; neutral; clear wavy boundary.

BA—10 to 14 inches; brown (10YR 4/3) loam; common yellowish red (5YR 4/6) mottles; weak medium subangular blocky structure; friable; few roots; neutral; clear wavy boundary.

Bg1—14 to 23 inches; grayish brown (10YR 5/2) loam; common strong brown (7.5YR 5/6) mottles; weak medium subangular blocky structure; friable; few roots; neutral; clear wavy boundary.

Bg2—23 to 32 inches; light gray (10YR 6/1) loam; many strong brown (7.5YR 5/6) mottles; weak coarse subangular blocky structure; friable; few roots; neutral; clear wavy boundary.

Cg1—32 to 41 inches; gray (10YR 5/1) silty clay loam; many strong brown (7.5YR 5/6) mottles; massive; friable; few roots; about 5 percent rock fragments; neutral; clear wavy boundary.

Cg2—41 to 65 inches; gray (10YR 5/1) gravelly silty clay loam; many yellowish brown (10YR 5/6) mottles; massive; friable; about 25 percent rock fragments; neutral.

The thickness of the solum ranges from 24 to 40 inches. The depth to bedrock is more than 60 inches. The content of gravel and cobbles ranges from 0 to 5 percent in the A horizon, from 0 to 15 percent in the B horizon, and from 0 to 25 percent in the C horizon. Reaction is slightly acid or neutral throughout.

The Ap horizon has hue of 10YR or 2.5Y, value of 3 or 4, and chroma of 2. The BA horizon has hue of 10YR to 5Y, value of 4 to 6, and chroma of 3 to 6. In the fine-earth fraction, it is silt loam or loam. It has weak, fine or medium, subangular blocky structure. It is friable.

The Bg horizon has hue of 10YR to 5Y or is neutral in hue. It has value of 4 to 6 and chroma of 0 to 6. In the fine-earth fraction, it is silt loam, loam, clay loam, or silty clay loam. It has weak or moderate, fine to coarse, granular or subangular blocky structure and is friable or very friable.

The C horizon has hue of 10YR to 5Y or is neutral in hue. It has value of 4 to 7 and chroma of 1 to 6. In the fine-earth fraction, it is silt loam, loam, sandy loam, or silty clay loam. The horizon is friable or very friable.

Potomac Series

The Potomac series consists of very deep, somewhat excessively drained soils that formed in gravelly alluvial material. These soils are on flood plains in the Valley and Ridge Physiographic Province. Slope ranges from 0 to 3 percent.

Potomac soils generally are near the well drained Chagrin and Tioga soils and the moderately well drained Lobdell soils. They have more rock fragments and more sand in the upper 40 inches than any of those soils.

Typical pedon of Potomac fine sandy loam, in a U.S. Forest Service picnic area; 3,000 feet south of St. Georges Church, 150 feet east of the South Branch of the Potomac River:

Ap—0 to 8 inches; very dark grayish brown (10YR 3/2) fine sandy loam, pale brown (10YR 6/3) dry; weak fine and medium granular structure; very friable; many roots; about 5 percent rock fragments; neutral; abrupt wavy boundary.

C1—8 to 14 inches; dark brown (10YR 3/3) gravelly loamy sand; massive; very friable; common roots; about 25 percent rock fragments; neutral; clear wavy boundary.

C2—14 to 42 inches; brown (7.5YR 4/4) extremely gravelly sand; single grain; loose; common roots; about 65 percent rock fragments; neutral; abrupt wavy boundary.

C3—42 to 64 inches; brown (7.5YR 5/4) sand; single grain; loose; about 5 percent rock fragments; neutral; clear wavy boundary.

C4—64 to 68 inches; brown (7.5YR 5/4) extremely cobbly sand; single grain; loose; about 60 percent rock fragments; neutral.

The thickness of the Ap horizon ranges from 3 to 12 inches. The depth to bedrock is more than 60 inches. The content of gravel and cobbles ranges from 0 to 50 percent, by volume, in the Ap horizon and from 35 to 70 percent, weighted average, in the C horizon. A few pedons have subhorizons that have a low percentage of rock fragments or none. Reaction ranges from strongly acid to neutral.

The Ap horizon has hue of 7.5YR or 10YR and value and chroma of 2 to 4. The C horizon has hue of 10YR or 7.5YR, value of 3 to 5, and chroma of 3 or 4. In the fine-earth fraction, it is sand or loamy sand. Thin subhorizons that are sandy loam in the fine-earth fraction are in some pedons.

Purdy Series

The Purdy series consists of very deep, poorly drained or very poorly drained soils that formed in acid alluvial material. These soils are on terraces along rivers in the Valley and Ridge Physiographic Province. Slope ranges from 0 to 3 percent.

Purdy soils generally are near the well drained Allegheny soils, the moderately well drained Monongahela soils, and the somewhat poorly drained Tygart soils. They have more clay in the subsoil than Allegheny and Monongahela soils. They do not have a fragipan, which is characteristic of Monongahela soils.

Typical pedon of Purdy silt loam; in a pasture across U.S. Route 220 from Christ Central Community Church near the community of Upper Tract, 100 yards northwest of power pole number MP 175-164:

Ap—0 to 6 inches; dark grayish brown (10YR 4/2) silt loam; common yellowish red (5YR 5/8) mottles; moderate fine and medium granular structure; friable; many roots; very strongly acid; clear wavy boundary.

BAg—6 to 11 inches; grayish brown (10YR 5/2) silt loam; common strong brown (7.5YR 5/8) mottles; moderate fine subangular blocky structure; friable; common roots; very strongly acid; clear wavy boundary.

Btg1—11 to 19 inches; dark gray (10YR 4/1) silty clay; common red (10R 4/8) and few strong brown (7.5YR 5/8) mottles; moderate medium angular blocky structure; firm; common roots; common distinct clay films on faces of peds; very strongly acid; gradual wavy boundary.

Btg2—19 to 28 inches; dark gray (10YR 4/1) silty clay; few red (10R 4/8) and common strong brown (7.5YR 5/8) mottles; weak medium prismatic structure parting to moderate fine angular blocky; firm; few roots; common distinct clay films on faces of peds; very strongly acid; gradual wavy boundary.

Btg3—28 to 36 inches; dark gray (10YR 4/1) silty clay; common strong brown (7.5YR 5/8) mottles; weak fine subangular blocky structure; firm; few roots; common faint clay films on faces of peds; very strongly acid; gradual wavy boundary.

Cg—36 to 65 inches; dark gray (N 4/0) silty clay; common light olive brown (2.5Y 5/4) and grayish brown (2.5Y 5/2) mottles; massive; firm; few roots; strongly acid.

The thickness of the solum ranges from 28 to 50 inches. The depth to bedrock is more than 60 inches. These soils usually are free of rock fragments. Reaction generally is strongly acid to extremely acid throughout, but the surface layer is less acid in limed areas.

The Ap horizon has hue of 10YR or 2.5Y, value of 4 or 5, and chroma of 0 to 2.

The BA and Bt horizons have hue of 10YR or 2.5Y or are neutral in hue. They have value of 4 or 5 and chroma of 0 to 2. In the fine-earth fraction, they are silty clay, clay, silty clay loam, or clay loam. The BA horizon also includes silt loam. The BA and Bt horizons have weak or moderate, fine or medium, prismatic, subangular blocky, or angular blocky structure. They are friable or firm.

The C horizon has hue of 10YR or 2.5Y or is neutral in hue. It has value of 4 to 6 and chroma of 0 to 3. In the fine-earth fraction, it is silty clay, clay, or clay loam. It is friable or firm.

Rushtown Series

The Rushtown series consists of very deep, excessively drained soils that formed in acid material weathered from shale. These soils are on uplands in the Valley and Ridge Physiographic Province. Slope ranges from 35 to 55 percent.

Rushtown soils generally are near the well drained Berks and Weikert soils. They are deeper over bedrock than those soils.

Typical pedon of Rushtown channery silt loam, 35 to 55 percent slopes, in a pasture; about 0.5 mile south of Kline Road bridge over the South Branch of the Potomac River, along farm access road:

Ap1—0 to 4 inches; dark brown (10YR 3/3) channery silt loam; weak medium granular structure; friable; many roots; about 20 percent rock fragments; strongly acid; abrupt wavy boundary.

Ap2—4 to 7 inches; brown (10YR 4/3) channery silt loam; weak fine and medium granular structure; friable; many roots; about 25 percent rock fragments; strongly acid; clear wavy boundary.

BA—7 to 13 inches; brown (7.5YR 4/4) very channery silt loam; weak fine subangular blocky structure; friable; common roots; about 40 percent rock fragments; strongly acid; clear wavy boundary.

Bw—13 to 24 inches; brown (7.5YR 4/4) very channery silt loam; weak fine and medium subangular blocky structure; friable; common roots; about 35 percent rock fragments; strongly acid; gradual wavy boundary.

BC—24 to 34 inches; brown (7.5YR 4/4) very channery silt loam; very weak medium subangular blocky structure; friable; few roots; about 40 percent rock fragments; strongly acid; clear wavy boundary.

C—34 to 65 inches; brown (7.5YR 4/4) extremely channery silt loam; loose; single grain; about 85 percent black shale fragments less than 0.5 inch in size; moderately acid.

The thickness of the solum ranges from 15 to 35 inches. The depth to bedrock is more than 60 inches. The content of shale fragments ranges from 20 to 35 percent in the A horizon, from 20 to 60 percent in the B horizon, and from 60 to 90 percent in the C horizon. Reaction ranges from moderately acid to very strongly acid.

The A horizon has hue of 10YR, value of 3 to 5, and chroma of 2 or 3.

The B horizon has hue of 10YR or 7.5YR, value of 4 or 5, and chroma of 4 to 6. In the fine-earth fraction, it is silt loam. It has weak or very weak, fine or medium, subangular blocky structure and is firm to very friable.

The C horizon has hue of 10YR or 7.5YR, value of 4 or 5, and chroma of 4 to 6. In the fine-earth fraction, it is silt loam. It is friable, very friable, or loose.

Shouns Series

The Shouns series consists of very deep, well drained soils that formed in acid colluvial material. These soils are on uplands in the Valley and Ridge Physiographic Province. They are also on the Appalachian Plateau. Slope ranges from 3 to 55 percent.

Shouns soils generally are near the well drained Belmont, Calvin, Cateache, and Lehew soils. They have less clay in the subsoil than Belmont soils. Shouns soils are deeper over bedrock than Belmont, Calvin, and Lehew soils. They also have fewer rock fragments in the control section than Calvin and Lehew soils.

Typical pedon of Shouns channery loam, 3 to 15 percent slopes, stony; 1.1 miles south of Camp Run Road, along the Mitchell Mountain Hunters Access Road, 30 yards upslope from a wildlife food plot:

Oe—1 inch to 0; partially decomposed leaf litter.

A—0 to 2 inches; dark brown (7.5YR 3/2) channery loam; moderate fine granular structure; very friable; many roots; about 25 percent rock fragments; very strongly acid; clear wavy boundary.

E—2 to 5 inches; yellowish red (5YR 4/6) channery loam; moderate fine and medium granular structure; friable; many roots; about 25 percent rock fragments; very strongly acid; clear wavy boundary.

BE—5 to 11 inches; reddish brown (5YR 4/4) channery loam; weak fine subangular blocky structure; friable;

many roots; about 20 percent rock fragments; very strongly acid; gradual wavy boundary.

Bt1—11 to 23 inches; reddish brown (5YR 4/4) channery loam; weak fine and medium subangular blocky structure; friable; few faint clay films on faces of peds; common roots; about 25 percent rock fragments; very strongly acid; gradual wavy boundary.

Bt2—23 to 35 inches; dark red (2.5YR 3/6) channery loam; weak fine and medium subangular blocky structure; friable to firm; few faint clay films on faces of peds; common roots; about 20 percent rock fragments; very strongly acid; clear wavy boundary.

Bt3—35 to 45 inches; dark red (2.5YR 3/6) channery loam; few weak red (2.5YR 5/2) lithochromic mottles and black coatings; weak fine subangular blocky structure; friable; few faint clay films on faces of peds; few roots; about 25 percent rock fragments; very strongly acid; clear wavy boundary.

C—45 to 65 inches; reddish brown (5YR 4/4) channery silt loam; weak medium platy structure; friable; few roots; about 25 percent rock fragments; very strongly acid.

The thickness of the solum ranges from 45 to 60 inches. The depth to bedrock is more than 60 inches. The content of sandstone, siltstone, and shale fragments ranges from 5 to 25 percent in the upper part of the solum and from 5 to 35 percent in the lower part and in the C horizon. Reaction ranges from moderately acid to very strongly acid.

The A horizon has hue of 10YR to 5YR, value of 3 to 5, and chroma of 2 to 6. The E horizon has hue of 10YR to 5YR, value of 4 or 5, and chroma of 4 to 6. In the fine-earth fraction, it is loam or silt loam.

The B horizon has hue of 10YR to 2.5YR, value of 3 to 5, and chroma of 4 to 8. In the fine-earth fraction, it is loam, silt loam, silty clay loam, or clay loam. It has weak or moderate, fine or medium, subangular blocky structure and is friable or firm.

The C horizon has hue of 10YR to 2.5YR, value of 3 to 5, and chroma of 3 to 8. In the fine-earth fraction, it is loam, silt loam, silty clay loam, or clay loam. It is friable to firm.

Simoda Series

The Simoda series consists of deep and very deep, moderately well drained soils that formed in acid material weathered from sandstone, siltstone, and shale. These soils are on uplands on the Appalachian Plateau and on top of Spruce Mountain. Slope ranges from 3 to 15 percent.

Simoda soils generally are near the well drained Mandy and Gauley soils and the poorly drained Trussel soils. They have a fragipan, which is not characteristic of Mandy or Gauley soils.

Typical pedon of Simoda channery loam, 3 to 15 percent slopes, extremely stony; in a wooded area on Spruce Mountain, 1.4 miles west-northwest of Simoda and 1.25 miles east of Seneca Creek:

A—0 to 5 inches; very dark brown (10YR 2/2) channery loam; moderate fine granular structure; very friable; many roots; about 25 percent rock fragments; very strongly acid; abrupt wavy boundary.

BA—5 to 13 inches; strong brown (7.5YR 5/6) channery loam; common dark brown (10YR 3/3) krotovinas; weak fine subangular blocky structure parting to weak medium granular; friable; many roots; about 25 percent rock fragments; very strongly acid; gradual wavy boundary.

Bw1—13 to 22 inches; yellowish brown (10YR 5/6) channery loam; common dark brown (10YR 3/3) krotovinas; weak medium and coarse subangular blocky structure; friable; many roots; few faint silt coatings on faces of peds; about 25 percent rock fragments; very strongly acid; gradual wavy boundary.

Bw2—22 to 26 inches; yellowish brown (10YR 5/4) channery loam; common dark brown (7.5YR 3/2) coatings on faces of peds; moderate thick platy structure; firm; few roots; few faint silt coatings on faces of peds; about 30 percent rock fragments; very strongly acid; clear wavy boundary.

Bx—26 to 40 inches; yellowish brown (10YR 5/4) channery sandy loam; common light brownish gray (10YR 6/2) and yellowish red (5YR 5/8) mottles; weak very coarse prismatic structure parting to moderate thick platy; very firm and brittle; few roots; few distinct silt coatings on faces of peds; about 30 percent rock fragments; very strongly acid; abrupt wavy boundary.

C—40 to 65 inches; yellowish brown (10YR 5/6) channery silty clay loam; pockets of silty clay weathered from shale; common light brownish gray (10YR 6/2) mottles; massive; friable; few roots; about 20 percent rock fragments; very strongly acid; clear wavy boundary.

R—65 inches; interbedded sandstone and shale.

The thickness of the solum ranges from 20 to 40 inches. The depth to bedrock is 40 to 72 inches. The content of rock fragments ranges from 5 to 35 percent throughout the solum and from 5 to 50 percent in the C horizon. Reaction ranges from strongly acid to extremely acid.

The A horizon has hue of 10YR, value of 2 to 4, and chroma of 2 or 3. The BA horizon has hue of 7.5YR to 2.5Y, value of 4 or 5, and chroma of 2 to 6. In the fine-earth fraction, it is loam, silt loam, or sandy loam.

The Bw horizon has hue of 7.5YR to 2.5Y, value of 4 or 5, and chroma of 3 to 6. In the fine-earth fraction, it is loam, silt loam, clay loam, or silty clay loam. It has weak or moderate, fine to coarse subangular blocky or thin or thick platy structure. It is friable or firm.

The Bx horizon has hue of 7.5YR to 2.5Y, value of 3 to 6, and chroma of 2 to 6. In the fine-earth fraction, it is loam, silt loam, sandy loam, clay loam, or silty clay loam. It has weak or moderate, coarse or very coarse, prismatic structure and is very firm and brittle.

The C horizon has hue of 7.5YR to 2.5Y, value of 3 to 6, and chroma of 2 to 6. In the fine-earth fraction, it is sandy loam, loam, clay loam, silt loam, silty clay loam, or silty clay. It is friable to firm.

Tioga Series

The Tioga series consists of very deep, well drained soils that formed in limy alluvial material. These soils are on flood plains in the Valley and Ridge Physiographic Province. Slope ranges from 0 to 3 percent.

Tioga soils generally are near the somewhat excessively drained Potomac soils, the well drained Chagrin soils, the moderately well drained Lobdell soils, and the somewhat poorly drained Orrville soils. They have less sand and fewer rock fragments above a depth of 40 inches than Potomac soils. They have less clay in the control section than Chagrin, Lobdell, and Orrville soils.

Typical pedon of Tioga loam; in a corn field south of Oak Flat, 115 feet northeast of Bolton Road, 175 feet northwest of the South Fork of the South Branch of the Potomac River:

Ap1—0 to 8 inches; brown (10YR 4/3, crushed) loam, pale brown (10YR 6/3) dry; dark brown (10YR 3/3) ped faces; weak fine granular structure; friable; many roots; slightly acid; abrupt smooth boundary.

Ap2—8 to 11 inches; brown (10YR 4/3, crushed) fine sandy loam, pale brown (10YR 6/3) dry; dark brown (10YR 3/3) faces of peds; weak fine and medium granular structure; friable; common roots; slightly acid; abrupt smooth boundary.

BA—11 to 15 inches; brown (10YR 4/3) loam; weak medium subangular blocky structure; friable; few roots; neutral; abrupt wavy boundary.

Bw1—15 to 25 inches; brown (10YR 4/3) loam; weak medium and coarse subangular blocky structure; friable; few roots; about 5 percent rock fragments; neutral; clear wavy boundary.

Bw2—25 to 30 inches; dark brown (10YR 3/3) sandy loam; weak medium and coarse subangular blocky structure; friable; few roots; about 5 percent rock fragments; neutral; clear wavy boundary.

Bw3—30 to 44 inches; dark brown (10YR 3/3) sandy loam; dark grayish brown (10YR 4/2) faces of peds; weak medium and coarse subangular blocky structure; friable; about 5 percent rock fragments; neutral; gradual wavy boundary.

C—44 to 65 inches; brown (10YR 4/3) very gravelly loamy sand; common dark grayish brown (10YR 4/2) and strong brown (7.5YR 5/6) mottles; single grain; very friable; about 50 percent rock fragments; neutral.

The thickness of the solum ranges from 18 to 44 inches. The depth to bedrock is more than 60 inches. The content of gravel ranges from 0 to 35 percent in the solum and from 0 to 60 percent in the C horizon. Reaction ranges from moderately acid to neutral.

The Ap horizon has hue of 10YR, value of 3 to 5, and chroma of 2 to 4.

The BA and Bw horizons have hue of 10YR or 7.5YR, value of 3 to 5, and chroma of 2 to 4. In the fine-earth fraction, they are dominantly fine sandy loam, sandy loam, or loam but have thin layers of loamy sand in some pedons. They have weak or moderate, fine to coarse, subangular blocky structure and are friable or very friable.

The C horizon has hue of 10YR or 7.5YR, value of 4 or 5, and chroma of 2 to 4. In the fine-earth fraction, it is loamy sand, sandy loam, or loam. It is friable to loose.

Toms Series

The Toms series consists of very deep, somewhat poorly drained soils that formed in limy colluvial material. These soils are on uplands in the Valley and Ridge Physiographic Province. Slope ranges from 3 to 8 percent.

Toms soils generally are near the well drained Caneyville and Edom soils and the moderately well drained Clarksburg and Ernest soils. They are deeper over bedrock than Caneyville and Edom soils. Toms soils have more clay in the subsoil than Clarksburg and Ernest soils and do not have a fragipan, which is characteristic of these soils.

Typical pedon of Toms silt loam, 3 to 8 percent slopes; 50 feet southwest of the unpaved Delta Route 12, 0.25 mile east of its intersection with Route 12, in the community of Deer Run:

Ap—0 to 5 inches; brown (10YR 5/3) silt loam;

moderate fine granular structure; friable; many roots; about 3 percent rock fragments; slightly acid; abrupt smooth boundary.

BA—5 to 8 inches; yellowish brown (10YR 5/4) silt loam; common light brownish gray (2.5Y 6/2) faces of peds; common grayish brown (10YR 5/2) mottles; weak fine subangular blocky structure; friable; many roots; about 3 percent rock fragments; slightly acid; clear wavy boundary.

Bt1—8 to 13 inches; yellowish brown (10YR 5/4) silty clay loam; light brownish gray (2.5Y 6/2) faces of peds; common grayish brown (10YR 5/2) and pale brown (10YR 6/3) mottles; moderate medium prismatic structure parting to strong medium subangular blocky; friable; common roots; about 3 percent rock fragments; common distinct clay films on faces of peds; mildly alkaline; clear wavy boundary.

Bt2—13 to 21 inches; yellowish brown (10YR 5/4) silty clay; light brownish gray (2.5Y 6/2) faces of peds; common light brownish gray (10YR 6/2) mottles; moderate medium prismatic structure parting to strong medium angular blocky; friable; few roots; about 5 percent rock fragments; common distinct clay films on faces of peds; mildly alkaline; clear wavy boundary.

Btg1—21 to 30 inches; light gray (10YR 6/1) channery silty clay; common yellowish brown (10YR 5/4) mottles; moderate medium prismatic structure; friable; few roots; about 20 percent rock fragments; common distinct clay films on faces of peds; mildly alkaline; clear wavy boundary.

Btg2—30 to 46 inches; light gray (10YR 6/1) channery silty clay loam; common yellowish brown (10YR 5/6) mottles; moderate coarse prismatic structure; friable; about 30 percent rock fragments; common distinct clay films on faces of peds; mildly alkaline; clear wavy boundary.

Cg—46 to 65 inches; light gray (10YR 6/1) very channery silty clay loam; many yellowish brown (10YR 5/6) mottles; massive; friable; about 40 percent rock fragments; mildly alkaline.

The thickness of the solum ranges from 40 to 60 inches. The depth to bedrock is more than 60 inches. The content of rock fragments ranges from 0 to 5 percent in the A horizon and the upper part of the B horizon and from 0 to 50 percent in the lower part of the B horizon and in the C horizon. Reaction ranges from moderately acid to mildly alkaline.

The Ap horizon has hue of 10YR, value of 3 to 5, and chroma of 2 to 4. The BA horizon has hue of 10YR or 2.5Y, value of 5 or 6, and chroma of 3 to 8. In the fine-earth fraction, it is loam or silt loam. It has weak, fine or medium, subangular blocky structure and is friable.

The Bt horizon is neutral in hue or has hue of 7.5YR to 2.5Y. It has value of 5 to 7 and chroma of 1 to 6. In the fine-earth fraction, it is silty clay loam, silty clay, or clay. It has weak to strong, fine to coarse, prismatic, subangular blocky, or angular blocky structure. It is friable to firm.

The C horizon is neutral in hue or has hue of 7.5YR to 2.5Y. It has value of 5 to 7 and chroma of 1 to 4. In the fine-earth fraction, it is clay loam, silty clay loam, silty clay, or clay. It is friable to firm.

Trussel Series

The Trussel series consists of very deep, poorly drained soils that formed mainly in acid colluvial material. These soils are on uplands on the Appalachian Plateau and on top of Spruce Mountain. Slope ranges from 3 to 15 percent.

Trussel soils generally are near the well drained Mandy and Gauley soils and the moderately well drained Simoda soils. They have a fragipan, which is not characteristic of Mandy or Gauley soils, and they are deeper over bedrock than these soils.

Typical pedon of Trussel channery loam, 3 to 15 percent slopes; 25 yards east of a fenced pond on Spruce Knob grazing allotment, 1.5 miles east of Spruce Knob Lake:

Oi—1 inch to 0; partially decomposed grass roots.

A—0 to 2 inches; very dark gray (10YR 3/1) channery loam; moderate fine granular structure; very friable; many roots; about 15 percent rock fragments; very strongly acid; abrupt wavy boundary.

E—2 to 3 inches; grayish brown (10YR 5/2) channery silt loam; common yellowish red (5YR 5/8) mottles; moderate medium granular structure; friable; many roots; about 15 percent rock fragments; very strongly acid; abrupt wavy boundary.

Bw1—3 to 7 inches; light brownish gray (10YR 6/2) channery silty clay loam; many strong brown (7.5YR 5/8) mottles; moderate medium subangular blocky structure; friable; common roots; common distinct silt coatings on faces of peds; about 15 percent rock fragments; very strongly acid; clear wavy boundary.

Bw2—7 to 12 inches; strong brown (7.5YR 5/6) channery silt loam; many light brownish gray (10YR 6/2) mottles; weak fine subangular blocky structure; friable; common roots; common distinct silt coatings on faces of peds; about 20 percent rock fragments; very strongly acid; clear wavy boundary.

Bx—12 to 21 inches; grayish brown (10YR 5/2) channery silt loam; common yellowish brown (10YR 5/4) and black (10YR 2/1) mottles; weak very coarse prismatic structure parting to weak fine subangular blocky; firm and slightly brittle; few roots; common faint silt coatings on faces of prisms; about 25 percent rock fragments; very strongly acid; clear wavy boundary.

BC—21 to 40 inches; yellowish brown (10YR 5/4) channery loam; common light brownish gray (10YR 6/2) and black (10YR 2/1) mottles; weak coarse and very coarse prismatic structure parting to weak medium platy; firm; few roots; about 25 percent rock fragments; very strongly acid; clear wavy boundary.

C1—40 to 51 inches; yellowish brown (10YR 5/4) channery loam; common light brownish gray (10YR 6/2) and dark gray (10YR 4/1) mottles; massive; friable; about 25 percent rock fragments; very strongly acid; clear wavy boundary.

C2—51 to 65 inches; yellowish brown (10YR 5/6) channery silt loam; common light brownish gray (10YR 6/2) and dark gray (10YR 4/1) mottles; massive; friable; about 30 percent rock fragments; very strongly acid.

The thickness of the solum ranges from 40 to 60 inches. The depth to bedrock is more than 60 inches. The content of rock fragments ranges from 0 to 20 percent in the A, E, and Bw horizons and from 20 to 60 percent in the Bx and C horizons. Reaction ranges from extremely acid to strongly acid.

The A horizon has hue of 10YR or 2.5Y, value of 2 to 5, and chroma of 1 to 4. The E horizon has hue of 7.5YR to 2.5Y, value of 4 to 7, and chroma of 1 or 2. In the fine-earth fraction, it is silt loam or loam.

The Bw horizon has hue of 7.5YR to 2.5Y, value of 4 to 6, and chroma of 2 to 8. In the fine-earth fraction, it is silt loam, loam, silty clay loam, or sandy clay loam. It has weak or moderate, fine or medium, subangular or angular blocky structure and is friable.

The Bx horizon has hue of 7.5YR to 2.5Y, value of 3 to 6, and chroma of 1 to 6. In the fine-earth fraction, it is silt loam or loam. It has weak very coarse prismatic structure parting to weak fine or medium subangular blocky or weak thin or medium platy. It is firm or very firm, and brittle.

The BC and C horizons have hue of 7.5YR to 2.5Y, value of 3 to 6, and chroma of 1 to 6. In the fine-earth fraction, they are silt loam or loam. They are friable or firm.

Tygart Series

The Tygart series consists of very deep, somewhat poorly drained soils that formed in acid alluvial material. These soils are on terraces, mainly along rivers. They are in the Valley and Ridge Physiographic Province. Slope ranges from 3 to 8 percent.

Tygart soils generally are near the well drained Allegheny soils, the moderately well drained Monongahela soils, and the poorly drained or very poorly drained Purdy soils. They have more clay in the subsoil than Allegheny and Monongahela soils and do not have a fragipan, which is characteristic of Monongahela soils.

Typical pedon of Tygart silt loam, 3 to 8 percent slopes, in a corn field; about 0.5 mile northeast of Brandywine, 400 feet south of U.S. Route 33, 2,200 feet west of the intersection of U.S. Route 33 and Heavener Run:

Ap—0 to 9 inches; brown (10YR 4/3) silt loam; weak medium granular structure; friable; many roots; about 2 percent rock fragments; neutral; abrupt wavy boundary.

BA—9 to 14 inches; brown (10YR 5/3) silty clay loam; common light brownish gray (10YR 6/2) faces of peds; strong brown (7.5YR 5/6) and red (10R 4/8) mottles; moderate fine and medium subangular blocky structure; friable; common roots; strongly acid; clear wavy boundary.

Bt—14 to 21 inches; brown (10YR 5/3) silty clay; light brownish gray (10YR 6/2) faces of peds; common strong brown (7.5YR 5/6), red (10R 4/8), and light brownish gray (10YR 6/2) mottles; moderate fine and medium angular blocky structure; firm; few roots; common distinct clay films on faces of peds; very strongly acid; gradual wavy boundary.

Btg1—21 to 32 inches; light brownish gray (10YR 6/2) silty clay; common strong brown (7.5YR 5/6) and few red (10R 4/8) mottles; moderate fine subangular blocky structure; firm; few roots; common distinct clay films on faces of peds; very strongly acid; clear wavy boundary.

Btg2—32 to 39 inches; gray (10YR 5/1) silty clay loam; common strong brown (7.5YR 5/6) and yellowish red (5YR 5/8) and few red (10R 4/8) mottles; moderate coarse prismatic structure parting to weak fine subangular blocky; firm; few roots; common faint clay films on faces of prisms; very strongly acid; clear wavy boundary.

Cg1—39 to 46 inches; light gray (10YR 6/1) silty clay; common strong brown (7.5YR 5/6) mottles; massive; firm; very strongly acid; clear wavy boundary.

Cg2—46 to 55 inches; mixed dark gray (N 4/0) and very dark gray (N 3/0) silty clay; massive; firm; very strongly acid; clear wavy boundary.

2Cg3—55 to 65 inches; mixed dark gray (N 4/0) and very dark gray (N 3/0) gravelly silty clay; massive; firm; about 30 percent rock fragments; very strongly acid.

The thickness of the solum ranges from 35 to 60 inches. The depth to bedrock is more than 60 inches. The content of rock fragments ranges from 0 to 3 percent above the 2C horizon and from 0 to 35 percent in the 2C horizon. Reaction generally is strongly acid or very strongly acid, but the surface layer is less acid in limed areas.

The A horizon has hue of 10YR or 2.5Y, value of 4 or 5, and chroma of 2 or 3.

The BA horizon and the upper part of the Bt horizon have hue of 10YR or 2.5Y, value of 5 or 6, and chroma of 3 to 6. The lower part of the Bt horizon has hue of 10YR or 2.5Y or is neutral in hue. It has value of 5 to 7 and chroma of 0 to 2. In the fine-earth fraction, the BA and Bt horizons are silty clay loam, silty clay, or clay. They have weak or moderate, medium to coarse, subangular blocky or prismatic structure and are friable or firm.

The C horizon has hue of 10YR or 2.5Y or is neutral in hue. It has value of 4 to 7 and chroma of 0 to 2. In the fine-earth fraction, it is silty clay loam, silty clay, or clay. It is friable or firm.

Udorthents

Udorthents consist of a mixture of soil material and rock fragments that have been disturbed significantly by man or of naturally occurring areas of very shallow, shaly soil material. These soils are in the Valley and Ridge Physiographic Province. Slope ranges from 0 to 80 percent.

Udorthents are extremely variable; therefore, a typical pedon is not given.

The naturally occurring areas of Udorthents are less than 10 inches deep. Outcrops of rock are common. The content of shale fragments ranges from 35 to 80 percent, by volume. Reaction is strongly acid or very strongly acid. These soils commonly have hue of 7.5YR to 2.5Y, value of 4 to 6, and chroma of 3 to 8. They are silt loam or loam in the fine-earth fraction. They are friable or very friable.

Weikert Series

The Weikert series consists of shallow, well drained soils that formed in acid material weathered mostly from shale and siltstone and from some sandstone. These soils are on uplands in the Valley and Ridge Physiographic Province. Slope ranges from 8 to 80 percent.

Weikert soils generally are near the excessively drained Rushtown soils and Lithic Udorthents, the well drained Berks soils, and the moderately well drained Ernest soils. They are shallower over bedrock than Berks, Ernest, and Rushtown soils. They are deeper over bedrock than Lithic Udorthents. Weikert soils have more rock fragments in the subsoil than Ernest soils and do not have a fragipan, which is characteristic of Ernest soils.

Typical pedon of Weikert channery silt loam, in a wooded area of Berks-Weikert channery silt loams, 25 to 55 percent slopes; 5 feet east of U.S. Forest Service Road 151, 0.7 mile south of Route 3/4:

Oa—12 inches to 0; decomposed leaf litter.

A—0 to 1 inch; dark grayish brown (10YR 4/2) channery silt loam; weak fine granular structure; friable; many roots; about 25 percent rock fragments; very strongly acid; abrupt wavy boundary.

E—1 to 4 inches; yellowish brown (10YR 5/4) channery silt loam; weak fine granular structure; friable; common roots; about 25 percent rock fragments; very strongly acid; abrupt wavy boundary.

Bw—4 to 10 inches; brownish yellow (10YR 6/6) very channery silt loam; weak medium subangular blocky structure; friable; few roots; about 35 percent rock fragments; very strongly acid; abrupt wavy boundary.

C—10 to 16 inches; brownish yellow (10YR 6/6) extremely channery silt loam; massive; friable; about 85 percent rock fragments; very strongly acid; abrupt wavy boundary.

R—16 inches; shale.

The thickness of the solum and the depth to bedrock range from 10 to 20 inches. The content of rock fragments, mostly shale and siltstone and some sandstone, ranges from 20 to 50 percent in the A horizon, from 35 to 60 percent in the B horizon, and from 60 to 85 percent in the C horizon. Reaction generally is strongly acid or very strongly acid, but the surface layer is less acid in limed areas.

The A horizon has hue of 10YR, value of 4 or 5, and chroma of 2 to 4. The E horizon has hue of 10YR, value of 5, and chroma of 4 to 6. In the fine-earth fraction, it is silt loam or loam.

The Bw horizon has hue of 10YR or 7.5YR, value of 4 to 6, and chroma of 3 to 6. In the fine-earth fraction, it is silt loam or loam. It has weak or moderate, fine or medium, subangular blocky structure and is friable or very friable.

The C horizon has hue of 10YR or 7.5YR, value of 4 to 6, and chroma of 3 to 6. In the fine-earth fraction, it is silt loam or loam. It is friable or very friable.

Formation of the Soils

The soils in this survey area formed as a result of the interaction of five major factors of soil formation: parent material, time, climate, living organisms, and topography *(8)*. Each factor modifies the effects of the others. Parent material, topography, and time have produced the major localized differences among the soils in the area. The influence of climate and living organisms generally is exhibited over broad areas. Soil variability caused by the effects of climate and living organisms is evident in two major areas of the county—the Appalachian Plateaus Physiographic Province and the Valley and Ridge Physiographic Province.

The results of the soil-forming processes can be observed in the different layers, or soil horizons, in the soil profile. The profile extends from the surface downward to material that has been changed only slightly by the soil-forming processes. Most soils have three major horizons, which are called the A, B, and C horizons. To indicate properties within these major horizons, they sometimes are further subdivided.

Many processes are involved in the formation of soil horizons. The more important of these are the accumulation of organic matter, the leaching of soluble salts, the reduction and transfer of iron, the formation and translocation of clay minerals, and the formation of soil structure. These processes have been taking place for thousands of years.

Most of the well drained and moderately well drained soils on uplands have a yellowish brown or strong brown B horizon. These colors are caused mainly by the presence of iron oxides. The B horizon in these soils has blocky structure.

A fragipan has formed in the B horizon of many of the soils on foot slopes and terraces. The fragipan is dense and brittle, is mottled, and has moderately slow or slow permeability. Most fragipans are gray in color, which is the result of an intense reduction of iron during soil formation, a process called gleying. Most of the soils that have a fragipan are moderately well drained to poorly drained.

In the following paragraphs, the five soil-forming processes and their influence on the soils in this survey area are described. Also discussed is the geology of the soils in the area.

Parent Material, Time, and Climate

The characteristics of the parent material strongly influence the time required for soil formation and the kind of soils that are formed. The soils in this survey area formed in residual, colluvial, and alluvial material.

Most of the soils in the area formed in residual material weathered from shale, siltstone, sandstone, limestone, and some chert. The residuum is the oldest parent material in the area. Some of the soils that formed in residual material, such as those of the Belmont series, are moderately well developed. In other soils, however, the effects of the soil-forming processes have been limited by the presence of rock that is resistant to weathering or by the slope. Dekalb soils, for example, are less developed than some of the soils that formed in younger parent material.

Some material moved downslope from the residual soils. This colluvial material is on foot slopes and at the head of drainageways. It is younger than the residual material, but the soil-forming processes have had a considerable amount of time to act on it. Many additions, losses, and alterations have taken place in the colluvial material. The resulting soils, such as those of the Ernest series, are strongly leached and moderately well developed.

The alluvial material on terraces and flood plains has been washed from soils that formed in residual and colluvial material. The soil-forming processes have had a considerable amount of time to act on the alluvial material on the terraces. Many additions, losses, and alterations have taken place. The resulting soils, such as those of the Monongahela series, are strongly leached and moderately well developed. The alluvium on the flood plains is the youngest parent material in the survey area.

The devastating flood of November 1985 left new alluvial deposits, many of which were several feet thick. The soils in these areas are in their initial stages of development. Much of the material is well suited to soil formation, but the soil-forming processes have had little time to act. These soils generally are weakly developed.

The climate is relatively uniform throughout most of the survey area, except at the higher elevations on Allegheny and Spruce Mountains, in the western part of the county. In these areas the mean annual precipitation is 38 percent higher and the mean temperature is more than 4 degrees lower than the rest of the survey area. Frigid soils, or those that have a mean annual soil temperature of below 47 degrees F, are at the higher elevations *(6)*. Mesic soils, or those that have a mean annual soil temperature of 47 to 59 degrees, are in the central and eastern parts of the county.

More information on climate is given in the section "General Nature of the County."

Living Organisms

All living organisms, including vegetation, animals, bacteria, fungi, and human beings, affect soil formation. The kind and amount of vegetation generally are responsible for the color of the surface layer and, in part, for the amount of organic matter and nutrients in the soil. Earthworms and burrowing animals help to keep the soil porous, and they mix organic and mineral matter by moving the material to the surface. Bacteria and fungi decompose organic matter, thus releasing nutrients for plants. Human beings influence the characteristics of the surface layer by activities such as clearcutting and plowing.

The coniferous forests at the higher elevations are partly responsible for the development of a spodic horizon in the Gauley soils. In addition to the presence of coniferous red spruce, the coarse-textured, acid parent material and the cool climate in these areas are conducive to the formation of Spodosols *(15)*.

Topography

Topography affects soil formation by its effect on the amount of water moving through the soil, the amount of runoff, and the degree of erosion.

Gently sloping and strongly sloping soils have a large amount of water moving through them. These soils have uniform depth and are moderately well developed or well developed. On the steep and very steep hillsides, less water moves through the soils and the rate of runoff is higher. The soils on these hillsides vary in depth to bedrock and are less well developed. The topography on the flood plains and young terraces is favorable for soil formation, and it progresses at a rapid rate in these areas. Soils on the flood plains are weakly developed, however, mainly because the material was deposited only a short time ago.

Geology

Gordon Bayles and Brian Ganoe, geologists, Soil Conservation Service, helped to prepare this section.

The landforms of Pendleton County clearly show the effects of uplift, folding, and geologic erosion. The relative resistance of various rocks to erosion and the folding have affected the topography of the county. The parallel ridges and valleys are oriented in a northeast-southwest direction. Outcrops of rock also follow this orientation. The ridgetops have formed in areas of the resistant sandstone, and the valleys have formed mainly in areas of the softer, erosive shale and limestone.

The survey area is divided into two principal physiographic provinces, or areas that have somewhat different geologic features *(3)*.

In the western part of the county, the Appalachian Plateaus Physiographic Province makes up the highest elevations. The rock in these areas is of the Upper Devonian, Mississippian, and Pennsylvanian Systems *(11)*. It includes the Chemung, Hampshire, Pocono, and MacCrady Formations, the Greenbrier, Mauch Chunk, and Pottsville Groups, and the Allegheny Formation *(5)*. It is dominantly sandstone and shale and smaller amounts of limestone. The dominant soils in this physiographic province are those of the Mandy, Gauley, Trussel, and Cateache series. Less extensive are soils of the Shouns, Simoda, and Belmont series.

The Valley and Ridge Physiographic Province makes up the rest of the county. The bedrock is steeply folded and highly faulted. A system of generally parallel rivers drains this area as the rivers flow northeastward toward the Chesapeake Bay. The rock in this area is of the Mississippian, Devonian, Silurian, and Ordivician Systems *(11)*. It includes numerous geologic formations, ranging from the Pocono Group, which is on the high knobs of Shenandoah Mountain, to the St. Paul Group, which is in Germany Valley *(5)*. It includes shale, sandstone, siltstone, limestone, and chert and a few outcrops of igneous rock. The dominant soils in this geologic province are those of the Berks, Weikert, Dekalb, Hazleton, Lehew, Opequon, and Elliber series. Several alluvial and colluvial soils are in the valleys and on the lower slopes.

The uplifted and folded geology of this survey area has resulted in a rugged topography that is scenic and attractive to tourists. It also has caused some problems. For example, the height of flooding is increased in areas upstream from water gaps, or where the rivers flow through narrow breaks in the anticlines *(10)*. Also, the steeply dipping bedrock on the flanks of the anticlines acts as a plane along which soils can slide when they become saturated with water. These slides usually occur during periods of high rainfall and flooding, such as during the major flood of 1985.

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Glossary

ABC soil. A soil having an A, a B, and a C horizon.

AC soil. A soil having only an A and a C horizon. Commonly, such soil formed in recent alluvium or on steep rocky slopes.

Aeration, soil. The exchange of air in soil with air from the atmosphere. The air in a well aerated soil is similar to that in the atmosphere; the air in a poorly aerated soil is considerably higher in carbon dioxide and lower in oxygen.

Aggregate, soil. Many fine particles held in a single mass or cluster. Natural soil aggregates, such as granules, blocks, or prisms, are called peds. Clods are aggregates produced by tillage or logging.

Alkali (sodic) soil. A soil having so high a degree of alkalinity (pH 8.5 or higher), or so high a percentage of exchangeable sodium (15 percent or more of the total exchangeable bases), or both, that plant growth is restricted.

Alluvium. Material, such as sand, silt, or clay, deposited on land by streams.

Appalachian Plateau. The area in the western part of Pendleton County where the geologic formations are more horizontally bedded, topography is more rolling, and climate is more severe than in the rest of the county.

Area reclaim (in tables). An area difficult to reclaim after the removal of soil for construction and other uses. Revegetation and erosion control are extremely difficult.

Association, soil. A group of soils geographically associated in a characteristic repeating pattern and defined and delineated as a single map unit.

Available water capacity (available moisture capacity). The capacity of soils to hold water available for use by most plants. It is commonly defined as the difference between the amount of soil water at field moisture capacity and the amount at wilting point. It is commonly expressed as inches of water per inch of soil. The capacity, in inches, in a 40-inch profile or to a limiting layer is expressed as—

Very low	0 to 2.4
Low	2.4 to 3.2
Moderate	3.2 to 5.2
High	more than 5.2

Base saturation. The degree to which material having cation-exchange properties is saturated with exchangeable bases (sum of Ca, Mg, Na, K), expressed as a percentage of the total cation-exchange capacity.

Bedrock. The solid rock that underlies the soil and other unconsolidated material or that is exposed at the surface.

Bottom land. The normal flood plain of a stream, subject to flooding.

Boulders. Rock fragments larger than 2 feet (60 centimeters) in diameter.

Calcareous soil. A soil containing enough calcium carbonate (commonly combined with magnesium carbonate) to effervesce visibly when treated with cold, dilute hydrochloric acid.

Capillary water. Water held as a film around soil particles and in tiny spaces between particles. Surface tension is the adhesive force that holds capillary water in the soil.

Catena. A sequence, or "chain," of soils on a landscape that formed in similar kinds of parent material but have different characteristics as a result of differences in relief and drainage.

Cation. An ion carrying a positive charge of electricity. The common soil cations are calcium, potassium, magnesium, sodium, and hydrogen.

Cation-exchange capacity. The total amount of exchangeable cations that can be held by the soil, expressed in terms of milliequivalents per 100 grams of soil at neutrality (pH 7.0) or at some other stated pH value. The term, as applied to soils, is synonymous with base-exchange capacity but is more precise in meaning.

Channery soil. A soil that is, by volume, 15 to 35 percent thin, flat fragments of sandstone, shale, slate, limestone, or schist as much as 6 inches along the longest axis. A single piece is called a channer. Very channery soil is 35 to 60 percent channers, and extremely channery soil is more than 60 percent channers.

Clay. As a soil separate, the mineral soil particles less than 0.002 millimeter in diameter. As a soil textural class, soil material that is 40 percent or more clay, less than 45 percent sand, and less than 40 percent silt.

Clay film. A thin coating of oriented clay on the surface of a soil aggregate or lining pores or root channels. Synonyms: clay coating, clay skin.

Coarse fragments. If round, mineral or rock particles 2 millimeters to 25 centimeters (10 inches) in diameter; if flat, mineral or rock particles (flagstone) 15 to 38 centimeters (6 to 15 inches) long.

Coarse textured soil. Sand or loamy sand.

Cobblestone (or cobble). A rounded or partly rounded fragment of rock 3 to 10 inches (7.5 to 25 centimeters) in diameter.

Cobbly soil. A soil that is, by volume, 15 to 35 percent cobbles. Very cobbly soil is 35 to 60 percent cobbles, and extremely cobbly soil is more than 60 percent cobbles.

Colluvium. Soil material, rock fragments, or both moved by creep, slide, or local wash and deposited at the base of steep slopes.

Complex slope. Irregular or variable slope. Planning or constructing terraces, diversions, and other water-control measures on a complex slope is difficult.

Complex, soil. A map unit of two or more kinds of soil in such an intricate pattern or so small in area that it is not practical to map them separately at the selected scale of mapping. The pattern and proportion of the soils are somewhat similar in all areas.

Compressible (in tables). Excessive decrease in volume of soft soil under load.

Concretions. Grains, pellets, or nodules of various sizes, shapes, and colors consisting of concentrated compounds or cemented soil grains. The composition of most concretions is unlike that of the surrounding soil. Calcium carbonate and iron oxide are common compounds in concretions.

Conservation tillage. A tillage system that does not invert the soil and that leaves a protective amount of crop residue on the surface throughout the year.

Consistence, soil. The feel of the soil and the ease with which a lump can be crushed by the fingers. Terms commonly used to describe consistence are—

Loose.—Noncoherent when dry or moist; does not hold together in a mass.

Friable.—When moist, crushes easily under gentle pressure between thumb and forefinger and can be pressed together into a lump.

Firm.—When moist, crushes under moderate pressure between thumb and forefinger, but resistance is distinctly noticeable.

Plastic.—When wet, readily deformed by moderate pressure but can be pressed into a lump; will form a "wire" when rolled between thumb and forefinger.

Sticky.—When wet, adheres to other material and tends to stretch somewhat and pull apart rather than to pull free from other material.

Hard.—When dry, moderately resistant to pressure; can be broken with difficulty between thumb and forefinger.

Soft.—When dry, breaks into powder or individual grains under very slight pressure.

Cemented.—Hard; little affected by moistening.

Contour stripcropping. Growing crops in strips that follow the contour. Strips of grass or close-growing crops are alternated with strips of clean-tilled crops or summer fallow.

Control section. The part of the soil on which classification is based. The thickness varies among different kinds of soil, but for many it is that part of the soil profile between depths of 10 inches and 40 or 80 inches.

Corrosive. High risk of corrosion to uncoated steel or deterioration of concrete.

Cover crop. A close-growing crop grown primarily to improve and protect the soil between periods of regular crop production, or a crop grown between trees and vines in orchards and vineyards.

Cutbanks cave (in tables). The walls of excavations tend to cave in or slough.

Deferred grazing. Postponing grazing or resting grazing land for a prescribed period.

Dense layer (in tables). A very firm, massive layer that has a bulk density of more than 1.8 grams per cubic centimeter. Such a layer affects the ease of digging and can affect filling and compacting.

Depth (soil). The thickness of a soil over bedrock or any other impervious layer. The following depth classes, expressed in inches, are recognized in this survey area:

Very shallow	less than 10
Shallow	10 to 20
Moderately deep	20 to 40
Deep	40 to 60
Very deep	more than 60

Depth to rock (in tables). Bedrock is too near the surface for the specified use.

Diversion (or diversion terrace). A ridge of earth, generally a terrace, built to protect downslope areas by diverting runoff from its natural course.

Drainage class (natural). Refers to the frequency and duration of periods of saturation or partial saturation during soil formation, as opposed to altered drainage, which is commonly the result of artificial drainage or irrigation but may be caused by the sudden deepening of channels or the blocking of drainage outlets. Seven classes of natural soil drainage are recognized:

Excessively drained.—Water is removed from the soil very rapidly. Excessively drained soils are commonly very coarse textured, rocky, or shallow. Some are steep. All are free of the mottling related to wetness.

Somewhat excessively drained.—Water is removed from the soil rapidly. Many somewhat excessively drained soils are sandy and rapidly pervious. Some are shallow. Some are so steep that much of the water they receive is lost as runoff. All are free of the mottling related to wetness.

Well drained.—Water is removed from the soil readily, but not rapidly. It is available to plants throughout most of the growing season, and wetness does not inhibit growth of roots for significant periods during most growing seasons. Well drained soils are commonly medium textured. They are mainly free of mottling.

Moderately well drained.—Water is removed from the soil somewhat slowly during some periods. Moderately well drained soils are wet for only a short time during the growing season, but periodically they are wet long enough that most mesophytic crops are affected. They commonly have a slowly pervious layer within or directly below the solum, or periodically receive high rainfall, or both.

Somewhat poorly drained.—Water is removed slowly enough that the soil is wet for significant periods during the growing season. Wetness markedly restricts the growth of mesophytic crops unless artificial drainage is provided. Somewhat poorly drained soils commonly have a slowly pervious layer, a high water table, additional water from seepage, nearly continuous rainfall, or a combination of these.

Poorly drained.—Water is removed so slowly that the soil is saturated periodically during the growing season or remains wet for long periods. Free water is commonly at or near the surface for long enough during the growing season that most mesophytic crops cannot be grown unless the soil is artificially drained. The soil is not continuously saturated in layers directly below plow depth. Poor drainage results from a high water table, a slowly pervious layer within the profile, seepage, nearly continuous rainfall, or a combination of these.

Very poorly drained.—Water is removed from the soil so slowly that free water remains at or on the surface during most of the growing season. Unless the soil is artificially drained, most mesophytic crops cannot be grown. Very poorly drained soils are commonly level or depressed and are frequently ponded. Yet, where rainfall is high and nearly continuous, they can have moderate or high slope gradients.

Drainage, surface. Runoff, or surface flow of water, from an area.

Eluviation. The movement of material in true solution or colloidal suspension from one place to another within the soil. Soil horizons that have lost material through eluviation are eluvial; those that have received material are illuvial.

Erosion. The wearing away of the land surface by water, wind, ice, or other geologic agents and by such processes as gravitational creep.

Erosion (geologic). Erosion caused by geologic processes acting over long geologic periods and resulting in the wearing away of mountains and the building up of such landscape features as flood plains and coastal plains. Synonym: natural erosion.

Erosion (accelerated). Erosion much more rapid than geologic erosion, mainly as a result of the activities of man or other animals or of a catastrophe in nature, for example, fire, that exposes the surface.

Excess fines (in tables). Excess silt and clay in the soil. The soil is not a source of gravel or sand for construction purposes.

Fast intake (in tables). The rapid movement of water into the soil.

Fertility, soil. The quality that enables a soil to provide plant nutrients, in adequate amounts and in proper balance, for the growth of specified plants when light, moisture, temperature, tilth, and other growth factors are favorable.

Field moisture capacity. The moisture content of a soil, expressed as a percentage of the ovendry weight, after the gravitational, or free, water has drained away; the field moisture content 2 or 3 days after a soaking rain; also called *normal field capacity, normal moisture capacity,* or *capillary capacity.*

Fine textured soil. Sandy clay, silty clay, and clay.

Flood plain. A nearly level alluvial plain that borders a stream and is subject to flooding unless protected artificially.

Foot slope. The inclined surface at the base of a hill.

Fragipan. A loamy, brittle subsurface horizon low in porosity and content of organic matter and low or moderate in clay but high in silt or very fine sand. A fragipan appears cemented and restricts roots.

When dry, it is hard or very hard and has a higher bulk density than the horizon or horizons above. When moist, it tends to rupture suddenly under pressure rather than to deform slowly.

Frost action (in tables). Freezing and thawing of soil moisture. Frost action can damage roads, buildings and other structures, and plant roots.

Genesis, soil. The mode of origin of the soil. Refers especially to the processes or soil-forming factors responsible for the formation of the solum, or true soil, from the unconsolidated parent material.

Gleyed soil. Soil that formed under poor drainage, resulting in the reduction of iron and other elements in the profile and in gray colors and mottles.

Grassed waterway. A natural or constructed waterway, typically broad and shallow, seeded to grass as protection against erosion. Conducts surface water away from cropland.

Gravel. Rounded or angular fragments of rock up to 3 inches (2 millimeters to 7.6 centimeters) in diameter. An individual piece is a pebble.

Gravelly soil material. Material that is 15 to 35 percent, by volume, rounded or angular rock fragments, not prominently flattened, up to 3 inches (7.6 centimeters) in diameter. Very gravelly soil material is 35 to 60 percent gravel, and extremely gravelly soil material is more than 60 percent gravel.

Green manure crop (agronomy). A soil-improving crop grown to be plowed under in an early stage of maturity or soon after maturity.

Ground water (geology). Water filling all the unblocked pores of underlying material below the water table.

Gully. A miniature valley with steep sides cut by running water and through which water ordinarily runs only after rainfall. The distinction between a gully and a rill is one of depth. A gully generally is an obstacle to farm machinery and is too deep to be obliterated by ordinary tillage; a rill is of lesser depth and can be smoothed over by ordinary tillage.

Hardpan. A hardened or cemented soil horizon, or layer. The soil material is sandy, loamy, or clayey and is cemented by iron oxide, silica, calcium carbonate, or other substance.

Horizon, soil. A layer of soil, approximately parallel to the surface, having distinct characteristics produced by soil-forming processes. In the identification of soil horizons, an uppercase letter represents the major horizons. Numbers or lowercase letters that follow represent subdivisions of the major horizons. The major horizons are as follows:

O horizon.—An organic layer of fresh and decaying plant residue.

A horizon.—The mineral horizon at or near the surface in which an accumulation of humified organic matter is mixed with the mineral material. Also, any plowed or disturbed surface layer.

E horizon.—The mineral horizon in which the main feature is loss of silicate clay, iron, aluminum, or some combination of these.

B horizon.—The mineral horizon below an O, A, or E horizon. The B horizon is in part a layer of transition from the overlying horizon to the underlying C horizon. The B horizon also has distinctive characteristics, such as (1) accumulation of clay, sesquioxides, humus, or a combination of these; (2) granular, prismatic, or blocky structure; (3) redder or browner colors than those in the A horizon; or (4) a combination of these.

C horizon.—The mineral horizon or layer, excluding indurated bedrock, that is little affected by soil-forming processes and does not have the properties typical of the overlying horizon. The material of a C horizon may be either like or unlike that in which the solum formed. If the material is known to differ from that in the solum, an Arabic numeral, commonly a 2, precedes the letter C.

Cr horizon.—Soft, consolidated bedrock beneath the soil.

R layer.—Hard, consolidated bedrock beneath the soil. The bedrock commonly underlies a C horizon but can be directly below an A or a B horizon.

Humus. The well decomposed, more or less stable part of the organic matter in mineral soils.

Hydrologic soil groups. Refers to soils grouped according to their runoff-producing characteristics. The chief consideration is the inherent capacity of soil bare of vegetation to permit infiltration. The slope and the kind of plant cover are not considered but are separate factors in predicting runoff. Soils are assigned to four groups. In group A are soils having a high infiltration rate when thoroughly wet and having a low runoff potential. They are mainly deep, well drained, and sandy or gravelly. In group D, at the other extreme, are soils having a very slow infiltration rate and thus a high runoff potential. They have a claypan or clay layer at or near the surface, have a permanent high water table, or are shallow over nearly impervious bedrock or other material. A soil is assigned to two hydrologic groups if part of the acreage is artificially drained and part is undrained.

Illuviation. The movement of soil material from one horizon to another in the soil profile. Generally, material is removed from an upper horizon and deposited in a lower horizon.

Impervious soil. A soil through which water, air, or roots penetrate slowly or not at all. No soil is absolutely impervious to air and water all the time.

Infiltration. The downward entry of water into the immediate surface of soil or other material, as contrasted with percolation, which is movement of water through soil layers or material.

Infiltration capacity. The maximum rate at which water can infiltrate into a soil under a given set of conditions.

Infiltration rate. The rate at which water penetrates the surface of the soil at any given instant, usually expressed in inches per hour. The rate can be limited by the infiltration capacity of the soil or the rate at which water is applied at the surface.

Karst (topography). The relief of an area underlain by limestone that dissolves in differing degrees, thus forming numerous depressions or small basins.

Krotovina. An animal burrow in a horizon that has been filled with organic matter or soil material from another horizon.

Landslide. The rapid downhill movement of a mass of soil and loose rock, generally when wet or saturated. The speed and distance of movement, as well as the amount of soil and rock material, vary greatly.

Large stones (in tables). Rock fragments 3 inches (7.6 centimeters) or more across. Large stones adversely affect the specified use of the soil.

Leaching. The removal of soluble material from soil or other material by percolating water.

Liquid limit. The moisture content at which the soil passes from a plastic to a liquid state.

Loam. Soil material that is 7 to 27 percent clay particles, 28 to 50 percent silt particles, and less than 52 percent sand particles.

Low strength. The soil is not strong enough to support loads.

Medium textured soil. Very fine sandy loam, loam, silt loam, or silt.

Mineral soil. Soil that is mainly mineral material and low in organic material. Its bulk density is more than that of organic soil.

Minimum tillage. Only the tillage essential to crop production and prevention of soil damage.

Miscellaneous area. An area that has little or no natural soil and supports little or no vegetation.

Moderately coarse textured soil. Coarse sandy loam, sandy loam, and fine sandy loam.

Moderately fine textured soil. Clay loam, sandy clay loam, and silty clay loam.

Morphology, soil. The physical makeup of the soil, including the texture, structure, porosity, consistence, color, and other physical, mineral, and biological properties of the various horizons, and the thickness and arrangement of those horizons in the soil profile.

Mottling, soil. Irregular spots of different colors that vary in number and size. Mottling generally indicates poor aeration and impeded drainage. Descriptive terms are as follows: abundance—*few, common,* and *many*; size—*fine, medium,* and *coarse*; and contrast—*faint, distinct,* and *prominent.* The size measurements are of the diameter along the greatest dimension. *Fine* indicates less than 5 millimeters (about 0.2 inch); *medium,* from 5 to 15 millimeters (about 0.2 to 0.6 inch); and *coarse,* more than 15 millimeters (about 0.6 inch).

Munsell notation. A designation of color by degrees of three simple variables—hue, value, and chroma. For example, a notation of 10YR 6/4 is a color of 10YR hue, value of 6, and chroma of 4.

Neutral soil. A soil having a pH value between 6.6 and 7.3. (See Reaction, soil.)

Nutrient, plant. Any element taken in by a plant essential to its growth. Plant nutrients are mainly nitrogen, phosphorus, potassium, calcium, magnesium, sulfur, iron, manganese, copper, boron, and zinc obtained from the soil and carbon, hydrogen, and oxygen obtained from the air and water.

Organic matter. Plant and animal residue in the soil in various stages of decomposition.

Pan. A compact, dense layer in a soil that impedes the movement of water and the growth of roots. For example, *hardpan, fragipan, claypan, plowpan,* and *traffic pan.*

Parent material. The unconsolidated organic and mineral material in which soil forms.

Ped. An individual natural soil aggregate, such as a granule, a prism, or a block.

Pedogenic. Refers to the development of soils through natural processes.

Pedon. The smallest volume that can be called "a soil." A pedon is three dimensional and large enough to permit study of all horizons. Its area ranges from about 10 to 100 square feet (1 square meter to 10 square meters), depending on the variability of the soil.

Percolation. The downward movement of water through the soil.

Percs slowly (in tables). The slow movement of water through the soil, adversely affecting the specified use.

Permeability. The quality of the soil that enables water to move downward through the profile. Permeability is measured as the number of inches per hour that water moves downward through the saturated soil. Terms describing permeability are:

Very slow	less than 0.06 inch
Slow	0.06 to 0.2 inch
Moderately slow	0.2 to 0.6 inch
Moderate	0.6 inch to 2.0 inches
Moderately rapid	2.0 to 6.0 inches
Rapid	6.0 to 20 inches
Very rapid	more than 20 inches

Phase, soil. A subdivision of a soil series based on features that affect its use and management. For example, slope, stoniness, and thickness.

pH value. A numerical designation of acidity and alkalinity in soil. (See Reaction, soil.)

Piping (in tables). Formation of subsurface tunnels or pipelike cavities by water moving through the soil.

Plasticity index. The numerical difference between the liquid limit and the plastic limit; the range of moisture content within which the soil remains plastic.

Plastic limit. The moisture content at which a soil changes from semisolid to plastic.

Plowpan. A compacted layer formed in the soil directly below the plowed layer.

Ponding. Standing water on soils in closed depressions. Unless the soils are artificially drained, the water can be removed only by percolation or evapotranspiration.

Poor filter (in tables). Because of rapid permeability, the soil may not adequately filter effluent from a waste disposal system.

Poorly graded. Refers to a coarse grained soil or soil material consisting mainly of particles of nearly the same size. Because there is little difference in size of the particles, density can be increased only slightly by compaction.

Poor outlets (in tables). Refers to areas where surface or subsurface drainage outlets are difficult or expensive to install.

Productivity, soil. The capability of a soil for producing a specified plant or sequence of plants under specific management.

Profile, soil. A vertical section of the soil extending through all its horizons and into the parent material.

Reaction, soil. A measure of acidity or alkalinity of a soil, expressed in pH values. A soil that tests to pH 7.0 is described as precisely neutral in reaction because it is neither acid nor alkaline. The degree of acidity or alkalinity is expressed as—

Extremely acid	below 4.5
Very strongly acid	4.5 to 5.0
Strongly acid	5.1 to 5.5
Medium acid	5.6 to 6.0
Slightly acid	6.1 to 6.5
Neutral	6.6 to 7.3
Mildly alkaline	7.4 to 7.8
Moderately alkaline	7.9 to 8.4
Strongly alkaline	8.5 to 9.0
Very strongly alkaline	9.1 and higher

Regolith. The unconsolidated mantle of weathered rock and soil material on the earth's surface; the loose earth material above the solid rock.

Relief. The elevations or inequalities of a land surface, considered collectively.

Residuum (residual soil material). Unconsolidated, weathered or partly weathered mineral material that accumulated as consolidated rock disintegrated in place.

Rill. A steep-sided channel resulting from accelerated erosion. A rill is generally a few inches deep and not wide enough to be an obstacle to farm machinery.

Rippable. Bedrock or hardpan can be excavated using a single-tooth ripping attachment mounted on a tractor with a 200-300 draw bar horsepower rating.

Rock fragments. Rock or mineral fragments having a diameter of 2 millimeters or more; for example, pebbles, cobbles, stones, and boulders.

Rooting depth (in tables). Shallow root zone. The soil is shallow over a layer that greatly restricts roots.

Root zone. The part of the soil that can be penetrated by plant roots.

Rubbly soil. A soil that has 50 to 90 percent of the surface covered with stones and boulders.

Runoff. The precipitation discharged into stream channels from an area. The water that flows off the surface of the land without sinking into the soil is called surface runoff. Water that enters the soil before reaching surface streams is called ground-water runoff or seepage flow from ground water.

Sand. As a soil separate, individual rock or mineral fragments from 0.05 millimeter to 2.0 millimeters in diameter. Most sand grains consist of quartz. As a soil textural class, a soil that is 85 percent or more sand and not more than 10 percent clay.

Sandstone. Sedimentary rock containing dominantly sand-size particles.

Sedimentary rock. Rock made up of particles deposited from suspension in water. The chief kinds of sedimentary rock are conglomerate, formed from gravel; sandstone, formed from sand; shale, formed from clay; and limestone, formed from soft masses of calcium carbonate. There are many intermediate types. Some wind-deposited sand is consolidated into sandstone.

Seepage (in tables). The movement of water through the soil. Seepage adversely affects the specified use.

Sequum. A sequence consisting of an illuvial horizon and the overlying eluvial horizon. (See Eluviation.)

Series, soil. A group of soils that have profiles that are almost alike, except for differences in texture of the surface layer or of the underlying material. All the soils of a series have horizons that are similar in composition, thickness, and arrangement.

Shale. Sedimentary rock formed by the hardening of a clay deposit.

Sheet erosion. The removal of a fairly uniform layer of soil material from the land surface by the action of rainfall and surface runoff.

Shrink-swell. The shrinking of soil when dry and the swelling when wet. Shrinking and swelling can damage roads, dams, building foundations, and other structures. It can also damage plant roots.

Silica. A combination of silicon and oxygen. The mineral form is called quartz.

Silt. As a soil separate, individual mineral particles that range in diameter from the upper limit of clay (0.002 millimeter) to the lower limit of very fine sand (0.05 millimeter). As a soil textural class, soil that is 80 percent or more silt and less than 12 percent clay.

Siltstone. Sedimentary rock made up of dominantly silt-sized particles.

Similar soils. Soils that share limits of diagnostic criteria, behave and perform in a similar manner, and have similar conservation needs or management requirements for the major land uses in the survey area.

Sinkhole. A depression in the landscape where limestone has been dissolved.

Site index. A designation of the quality of a forest site based on the height of the dominant stand at an arbitrarily chosen age. For example, if the average height attained by dominant and codominant trees in a fully stocked stand at the age of 50 years is 75 feet, the site index is 75 feet.

Slippage (in tables). Soil mass susceptible to movement downslope when loaded, excavated, or wet.

Slope. The inclination of the land surface from the horizontal. Percentage of slope is the vertical distance divided by horizontal distance, then multiplied by 100. Thus, a slope of 20 percent is a drop of 20 feet in 100 feet of horizontal distance. The following slope classes (by percentage) are recognized in this survey:

Nearly level	0 to 3
Gently sloping	3 to 8
Strongly sloping	8 to 15
Moderately steep	15 to 25
Steep	25 to 35
Very steep	35 to 55
Extremely steep	55 to 80

Slope (in tables). Slope is great enough that special practices are required to ensure satisfactory performance of the soil for a specific use.

Slow intake (in tables). The slow movement of water into the soil.

Small stones (in tables). Rock fragments less than 3 inches (7.6 centimeters) in diameter. Small stones adversely affect the specified use of the soil.

Soil. A natural, three-dimensional body at the Earth's surface. It is capable of supporting plants and has properties resulting from the integrated effect of climate and living matter acting on earthy parent material, as conditioned by relief over periods of time.

Soil separates. Mineral particles less than 2 millimeters in equivalent diameter and ranging between specified size limits. The names and sizes, in millimeters, of separates recognized in the United States are as follows:

Very coarse sand	2.0 to 1.0
Coarse sand	1.0 to 0.5
Medium sand	0.5 to 0.25
Fine sand	0.25 to 0.10
Very fine sand	0.10 to 0.05
Silt	0.05 to 0.002
Clay	less than 0.002

Solum. The upper part of a soil profile, above the C horizon, in which the processes of soil formation are active. The solum in soil consists of the A, E, and B horizons. Generally, the characteristics of the material in these horizons are unlike those of the underlying material. The living roots and plant and animal activities are largely confined to the solum.

Stones. Rock fragments 10 to 24 inches (25 to 60 centimeters) in diameter.

Stony. Refers to a soil containing stones in numbers that interfere with or prevent tillage. Soils are stony if 1 to 3 percent of the surface is covered with stones, very stony if 3 to 15 percent is covered, and extremely stony if 15 to 50 percent is covered.

Stripcropping. Growing crops in a systematic arrangement of strips or bands which provide vegetative barriers to wind and water erosion.

Structure, soil. The arrangement of primary soil particles into compound particles or aggregates. The principal forms of soil structure are—*platy* (laminated), *prismatic* (vertical axis of aggregates longer than horizontal), *columnar* (prisms with rounded tops), *blocky* (angular or subangular), and *granular. Structureless* soils are either *single grained* (each grain by itself, as in dune sand) or *massive* (the particles adhering without any regular cleavage, as in many hardpans).

Stubble mulch. Stubble or other crop residue left on the soil or partly worked into the soil. It protects the soil from wind and water erosion after harvest, during preparation of a seedbed for the next crop, and during the early growing period of the new crop.

Subsoil. Technically, the B horizon; roughly, the part of the solum below plow depth.

Substratum. The part of the soil below the solum.

Subsurface layer. Any surface soil horizon (A, E, AB, or EB) below the surface layer.

Surface layer. The soil ordinarily moved in tillage, or its equivalent in uncultivated soil, ranging in depth from about 4 to 10 inches (10 to 25 centimeters). Frequently designated as the "plow layer," or the "Ap horizon."

Surface soil. The A, E, AB, and EB horizons. It includes all subdivisions of these horizons.

Taxadjuncts. Soils that cannot be classified in a series recognized in the classification system. Such soils are named for a series they strongly resemble and are designated as taxadjuncts to that series because they differ in ways too small to be of consequence in interpreting their use and behavior.

Terrace. An embankment, or ridge, constructed across sloping soils on the contour or at a slight angle to the contour. The terrace intercepts surface runoff so that water soaks into the soil or flows slowly to a prepared outlet.

Terrace (geologic). An old alluvial plain, ordinarily flat or undulating, bordering a river, a lake, or the sea.

Texture, soil. The relative proportions of sand, silt, and clay particles in a mass of soil. The basic textural classes, in order of increasing proportion of fine particles, are *sand, loamy sand, sandy loam, loam, silt loam, silt, sandy clay loam, clay loam, silty clay loam, sandy clay, silty clay,* and *clay*. The sand, loamy sand, and sandy loam classes may be further divided by specifying "coarse," "fine," or "very fine."

Thin layer (in tables). Otherwise suitable soil material too thin for the specified use.

Tilth, soil. The physical condition of the soil as related to tillage, seedbed preparation, seedling emergence, and root penetration.

Topsoil. The upper part of the soil, which is the most favorable material for plant growth. It is ordinarily rich in organic matter and is used to topdress roadbanks, lawns, and land affected by mining.

Trace elements. Chemical elements, for example, zinc, cobalt, manganese, copper, and iron, are in soils in extremely small amounts. They are essential to plant growth.

Unstable fill (in tables). Risk of caving or sloughing on banks of fill material.

Upland (geology). Land at a higher elevation, in general, than the alluvial plain or stream terrace; land above the lowlands along streams.

Valley and Ridge Physiographic Province. A system of folded, parallel ridges and valleys that makes up the eastern three-fourths of Pendleton County.

Variant, soil. A soil having properties sufficiently different from those of other known soils to justify a new series name, but occurring in such a limited geographic area that creation of a new series is not justified.

Variegation. Refers to patterns of contrasting colors assumed to be inherited from the parent material rather than to be the result of poor drainage.

Weathering. All physical and chemical changes produced in rocks or other deposits at or near the earth's surface by atmospheric agents. These changes result in disintegration and decomposition of the material.

Well graded. Refers to soil material consisting of coarse grained particles that are well distributed over a wide range in size or diameter. Such soil normally can be easily increased in density and bearing properties by compaction. Contrasts with poorly graded soil.

Wilting point (or permanent wilting point). The moisture content of soil, on an ovendry basis, at which a plant (specifically a sunflower) wilts so much that it does not recover when placed in a humid, dark chamber.

Tables

TABLE 1.--TEMPERATURE AND PRECIPITATION

(Recorded in the period 1951-79 at Franklin and Spruce Knob, West Virginia)

Month	Temperature						Precipitation				
	Average daily maximum	Average daily minimum	Average daily	2 years in 10 will have-- Maximum temperature higher than--	2 years in 10 will have-- Minimum temperature lower than--	Average number of growing degree days*	Average	2 years in 10 will have-- Less than--	2 years in 10 will have-- More than--	Average number of days with 0.10 inch or more	Average snowfall
	°F	°F	°F	°F	°F	Units	In	In	In		In
FRANKLIN:											
January----	42.5	20.2	31.4	67	-7	52	1.95	0.91	2.84	4	7.3
February---	45.1	21.8	33.5	71	-3	61	2.00	.72	3.06	5	8.0
March------	53.8	29.1	41.5	80	8	168	2.79	1.60	3.83	7	6.2
April------	65.1	37.9	51.5	86	18	345	2.56	1.43	3.54	7	.9
May--------	73.9	46.6	60.3	89	25	629	3.08	1.57	4.38	7	.0
June-------	80.3	53.5	66.9	92	36	807	3.37	1.96	4.62	7	.0
July-------	83.6	57.6	70.6	94	42	949	3.29	2.07	4.39	8	.0
August-----	82.9	56.7	69.8	94	40	924	3.37	1.55	4.92	8	.0
September--	77.0	50.4	63.7	92	29	711	2.91	1.29	4.29	5	.0
October----	67.1	39.2	53.2	85	18	409	3.07	1.07	4.72	5	.2
November---	55.3	31.2	43.3	77	9	139	2.04	.98	2.95	5	2.5
December---	45.6	23.7	34.7	71	-1	69	2.05	.83	3.07	5	5.8
Yearly:											
Average---	64.4	39.0	51.7	---	---	---	---	---	---	---	---
Extreme---	---	---	---	95	-8	---	---	---	---	---	---
Total-----	---	---	---	---	---	5,263	32.48	27.98	36.47	73	30.9
SPRUCE KNOB:											
January----	35.9	16.5	26.2	62	-12	42	3.09	1.75	4.27	8	24.8
February---	37.4	17.9	27.7	62	-11	22	3.00	1.67	4.17	8	25.0
March------	45.6	25.3	35.5	72	3	84	3.80	2.56	4.93	10	24.2
April------	57.3	36.4	46.9	80	13	233	3.49	2.04	4.78	10	7.6
May--------	66.8	45.3	56.1	82	25	499	3.69	2.17	5.03	9	.4
June-------	73.8	52.8	63.3	86	36	699	3.87	2.66	4.98	9	.0
July-------	77.3	56.3	66.8	88	42	831	3.69	2.24	4.99	9	.0
August-----	77.1	55.4	66.3	87	41	815	3.52	1.78	5.03	8	.0
September--	71.8	48.9	60.4	86	31	612	3.40	1.56	4.97	7	.0
October----	61.3	38.9	50.1	80	17	333	3.37	1.48	4.97	7	1.6
November---	49.5	29.7	39.6	73	3	107	2.74	1.82	3.56	7	8.5
December---	39.5	20.1	29.8	64	-4	45	3.09	1.64	4.36	8	18.9
Yearly:											
Average--	57.8	37.0	47.4	---	---	---	---	---	---	---	---
Extreme--	---	---	---	88	-13	---	---	---	---	---	---
Total----	---	---	---	---	---	4,322	40.75	35.24	46.05	100	111.0

* A growing degree day is a unit of heat available for plant growth. It can be calculated by adding the maximum and minimum daily temperatures, dividing the sum by 2, and subtracting the temperature below which growth is minimal for the principal crops in the area (40 degrees F).

TABLE 2.--FREEZE DATES IN SPRING AND FALL

(Recorded in the period 1951-79 at Franklin and Spruce Knob, West Virginia)

Probability	Temperature		
	24 °F or lower	28 °F or lower	32 °F or lower
FRANKLIN:			
Last freezing temperature in spring:			
1 year in 10 later than--	Apr. 24	May 13	May 31
2 years in 10 later than--	Apr. 19	May 7	May 24
5 years in 10 later than--	Apr. 10	Apr. 26	May 10
First freezing temperature in fall:			
1 year in 10 earlier than--	Oct. 7	Sept. 23	Sept. 19
2 years in 10 earlier than--	Oct. 13	Sept. 29	Sept. 24
5 years in 10 earlier than--	Oct. 24	Oct. 10	Oct. 2
SPRUCE KNOB:			
Last freezing temperature in spring:			
1 year in 10 later than--	May 6	May 20	June 2
2 years in 10 later than--	Apr. 30	May 13	May 25
5 years in 10 later than--	Apr. 19	Apr. 30	May 11
First freezing temperature in fall:			
1 year in 10 earlier than--	Oct. 7	Sept. 30	Sept. 17
2 years in 10 earlier than--	Oct. 13	Oct. 6	Sept. 22
5 years in 10 earlier than--	Oct. 26	Oct. 16	Oct. 2

TABLE 3.--GROWING SEASON

(Recorded in the period 1951-79 at Franklin and Spruce Knob, West Virginia)

Probability	Daily minimum temperature		
	Higher than 24 °F	Higher than 28 °F	Higher than 32 °F
	Days	Days	Days
FRANKLIN:			
9 years in 10	173	142	120
8 years in 10	181	150	129
5 years in 10	196	166	144
2 years in 10	210	183	160
1 year in 10	218	191	168
SPRUCE KNOB:			
9 years in 10	162	144	114
8 years in 10	172	152	124
5 years in 10	190	168	143
2 years in 10	207	184	162
1 year in 10	217	192	172

TABLE 4.--ACREAGE AND PROPORTIONATE EXTENT OF THE SOILS

Map symbol	Soil name	Acres	Percent
AgB	Allegheny loam, 3 to 8 percent slopes	1,100	0.2
AgC	Allegheny loam, 8 to 15 percent slopes	240	0.1
BcC	Belmont-Cateache silt loams, 8 to 15 percent slopes	890	0.2
BcD	Belmont-Cateache silt loams, 15 to 25 percent slopes	660	0.1
BeC	Belmont-Cateache silt loams, 3 to 15 percent slopes, stony	460	0.1
BeE	Belmont-Cateache silt loams, 15 to 35 percent slopes, stony	3,030	0.7
BeF	Belmont-Cateache silt loams, 35 to 55 percent slopes, stony	5,170	1.2
BeG	Belmont-Cateache silt loams, 55 to 80 percent slopes, stony	190	*
BkC	Berks channery silt loam, 8 to 15 percent slopes	1,730	0.4
BkD	Berks channery silt loam, 15 to 25 percent slopes	3,030	0.7
BkE	Berks channery silt loam, 25 to 35 percent slopes	2,590	0.6
BkF	Berks channery silt loam, 35 to 55 percent slopes	3,530	0.8
BmE	Berks channery loam, 15 to 35 percent slopes, stony	2,070	0.5
BmF	Berks channery loam, 35 to 55 percent slopes, stony	13,170	3.0
BmG	Berks channery loam, 55 to 80 percent slopes, stony	3,320	0.7
BnC	Berks-Weikert channery silt loams, 8 to 15 percent slopes	3,800	0.9
BnD	Berks-Weikert channery silt loams, 15 to 25 percent slopes	10,660	2.4
BnD3	Berks-Weikert channery silt loams, 15 to 25 percent slopes, severely eroded	550	0.1
BnF	Berks-Weikert channery silt loams, 25 to 55 percent slopes	35,720	8.0
BnF3	Berks-Weikert channery silt loams, 25 to 55 percent slopes, severely eroded	9,210	2.1
BnG	Berks-Weikert channery silt loams, 55 to 80 percent slopes	1,510	0.3
BnG3	Berks-Weikert channery silt loams, 55 to 80 percent slopes, severely eroded	570	0.1
BrC	Blackthorn channery sandy loam, 8 to 15 percent slopes	540	0.1
BrD	Blackthorn channery sandy loam, 15 to 25 percent slopes	330	0.1
BsC	Blackthorn channery sandy loam, 3 to 15 percent slopes, stony	6,770	1.5
BsE	Blackthorn channery sandy loam, 15 to 35 percent slopes, stony	9,670	2.2
BsF	Blackthorn channery sandy loam, 35 to 55 percent slopes, stony	1,940	0.4
BtC	Blackthorn-Dekalb-Elliber association, 3 to 15 percent slopes, stony	2,670	0.6
BtE	Blackthorn-Dekalb-Elliber association, 15 to 35 percent slopes, stony	20,090	4.5
BuB	Buchanan channery loam, 3 to 8 percent slopes	650	0.1
BuC	Buchanan channery loam, 8 to 15 percent slopes	650	0.1
CaC	Calvin channery silt loam, 3 to 15 percent slopes	510	0.1
CaD	Calvin channery silt loam, 15 to 25 percent slopes	210	*
CdC	Calvin-Dekalb-Hazleton complex, 3 to 15 percent slopes, stony	890	0.2
CdE	Calvin-Dekalb-Hazleton complex, 15 to 35 percent slopes, stony	4,400	1.0
CdF	Calvin-Dekalb-Hazleton complex, 35 to 55 percent slopes, stony	15,610	3.5
CdG	Calvin-Dekalb-Hazleton complex, 55 to 80 percent slopes, stony	22,420	5.1
CeC	Cateache silt loam, 8 to 15 percent slopes	420	0.1
CfC	Cateache channery silt loam, 3 to 15 percent slopes, stony	1,020	0.2
CfE	Cateache channery silt loam, 15 to 35 percent slopes, stony	2,430	0.5
CfF	Cateache channery silt loam, 35 to 55 percent slopes, stony	9,300	2.1
CfG	Cateache channery silt loam, 55 to 80 percent slopes, stony	1,790	0.4
Ch	Chagrin loam	1,760	0.4
CkB	Clarksburg channery silt loam, 3 to 8 percent slopes	350	0.1
CkC	Clarksburg channery silt loam, 8 to 15 percent slopes	1,020	0.2
ClC	Clarksburg channery silt loam, 3 to 15 percent slopes, stony	3,450	0.8
ClD	Clarksburg channery silt loam, 15 to 25 percent slopes, stony	2,060	0.5
DeF	Dekalb-Elliber-Blackthorn association, 35 to 55 percent slopes, stony	48,780	11.0
DfG	Dekalb-Elliber association, 55 to 80 percent slopes, stony	1,590	0.4
Du	Dunning silt loam	210	*
EdC	Edom channery silt loam, 8 to 15 percent slopes	2,550	0.6
EdD	Edom channery silt loam, 15 to 25 percent slopes	3,220	0.7
EdE	Edom channery silt loam, 25 to 35 percent slopes	2,220	0.5
EdF	Edom channery silt loam, 35 to 55 percent slopes	3,090	0.7
ElC	Elliber extremely channery loam, 8 to 15 percent slopes	1,300	0.3
ElD	Elliber extremely channery loam, 15 to 25 percent slopes	1,560	0.4
ElE	Elliber extremely channery loam, 25 to 35 percent slopes	1,640	0.4
ElF	Elliber extremely channery loam, 35 to 55 percent slopes	2,170	0.5
ErB	Ernest silt loam, 3 to 8 percent slopes	1,720	0.4
ErC	Ernest silt loam, 8 to 15 percent slopes	2,700	0.6
ErD	Ernest silt loam, 15 to 25 percent slopes	450	0.1
GaC	Gauley channery loam, 3 to 15 percent slopes, rubbly	1,180	0.3
GaE	Gauley channery loam, 15 to 35 percent slopes, rubbly	820	0.2

See footnote at end of table.

TABLE 4.--ACREAGE AND PROPORTIONATE EXTENT OF THE SOILS--Continued

Map symbol	Soil name	Acres	Percent
GaF	Gauley channery loam, 35 to 55 percent slopes, rubbly	1,180	0.3
GaG	Gauley channery loam, 55 to 80 percent slopes, rubbly	400	0.1
HdC	Hazleton-Dekalb complex, 3 to 15 percent slopes, stony	4,050	0.9
HdE	Hazleton-Dekalb complex, 15 to 35 percent slopes, stony	5,560	1.3
HdF	Hazleton-Dekalb complex, 35 to 55 percent slopes, stony	5,350	1.2
HdG	Hazleton-Dekalb complex, 55 to 80 percent slopes, stony	510	0.1
LaC	Laidig channery loam, 8 to 15 percent slopes	480	0.1
LaD	Laidig channery loam, 15 to 25 percent slopes	280	0.1
LdE	Laidig channery loam, 15 to 35 percent slopes, stony	12,200	2.7
LeF	Laidig channery loam, 35 to 55 percent slopes, very stony	960	0.2
LgC	Laidig and Buchanan soils, 3 to 15 percent slopes, stony	11,040	2.5
LhC	Lehew and Dekalb soils, 8 to 15 percent slopes	1,110	0.2
LhD	Lehew and Dekalb soils, 15 to 25 percent slopes	960	0.2
LkC	Lehew, Hazleton, and Dekalb soils, 3 to 15 percent slopes, stony	1,790	0.4
LkE	Lehew, Hazleton, and Dekalb soils, 15 to 35 percent slopes, stony	5,190	1.2
LkF	Lehew, Hazleton, and Dekalb soils, 35 to 55 percent slopes, stony	20,310	4.6
LkG	Lehew, Hazleton, and Dekalb soils, 55 to 80 percent slopes, stony	3,830	0.9
LmF	Lithic Udorthents-Rock outcrop complex, 35 to 80 percent slopes	500	0.1
Lo	Lobdell loam	1,180	0.3
MaC	Mandy channery silt loam, 8 to 15 percent slopes	1,130	0.3
MaD	Mandy channery silt loam, 15 to 25 percent slopes	670	0.2
MdE	Mandy channery silt loam, 15 to 35 percent slopes, stony	1,100	0.2
MdF	Mandy channery silt loam, 35 to 55 percent slopes, stony	1,840	0.4
Mn	Massanetta silt loam	130	*
MoB	Monongahela silt loam, 3 to 8 percent slopes	2,330	0.5
MoC	Monongahela silt loam, 8 to 15 percent slopes	700	0.2
OeC	Opequon silt loam, 3 to 15 percent slopes, very rocky	1,380	0.3
OeE	Opequon silt loam, 15 to 35 percent slopes, very rocky	6,980	1.6
OeF	Opequon silt loam, 35 to 55 percent slopes, very rocky	14,310	3.2
OeG	Opequon silt loam, 55 to 80 percent slopes, very rocky	620	0.1
OnC3	Opequon-Caneyville silty clay loams, 8 to 15 percent slopes, severely eroded	470	0.1
OnD3	Opequon-Caneyville silty clay loams, 15 to 25 percent slopes, severely eroded	660	0.1
OnE3	Opequon-Caneyville silty clay loams, 25 to 35 percent slopes, severely eroded	810	0.2
OnF3	Opequon-Caneyville silty clay loams, 35 to 55 percent slopes, severely eroded	4,930	1.1
Or	Orrville loam	1,110	0.2
Po	Potomac fine sandy loam	5,440	1.2
Pt	Potomac very cobbly fine sandy loam	8,030	1.8
Pu	Purdy silt loam	210	*
Qu	Quarry, limestone	100	*
Ro	Rock outcrop and Rubble land	3,560	0.8
RuF	Rushtown channery silt loam, 35 to 55 percent slopes	190	*
ShC	Shouns channery loam, 3 to 15 percent slopes, stony	2,040	0.5
ShE	Shouns channery loam, 15 to 35 percent slopes, stony	1,110	0.2
SnC	Shouns channery loam, 3 to 15 percent slopes, very stony	1,660	0.4
SnE	Shouns channery loam, 15 to 35 percent slopes, very stony	4,100	0.9
SnF	Shouns channery loam, 35 to 55 percent slopes, very stony	1,920	0.4
SoC	Shouns channery loam, 3 to 15 percent slopes, rubbly	230	0.1
SoE	Shouns channery loam, 15 to 35 percent slopes, rubbly	2,180	0.5
SoF	Shouns channery loam, 35 to 55 percent slopes, rubbly	3,170	0.7
SrB	Simoda channery loam, 3 to 15 percent slopes, extremely stony	800	0.2
Tg	Tioga loam	1,000	0.2
ToB	Toms silt loam, 3 to 8 percent slopes	1,270	0.3
TrC	Trussel channery loam, 3 to 15 percent slopes	270	0.1
TsC	Trussel channery loam, 3 to 15 percent slopes, extremely stony	710	0.2
TyB	Tygart silt loam, 3 to 8 percent slopes	380	0.1
Ud	Udorthents, smoothed	510	0.1
	Water	520	0.1
	Total	444,800	100.0

* Less than 0.1 percent.

TABLE 5.--PRIME FARMLAND

(Only the soils considered prime farmland are listed. Urban or built-up areas of the soils listed are not considered prime farmland)

Map symbol	Soil name
AgB	Allegheny loam, 3 to 8 percent slopes
BuB	Buchanan channery loam, 3 to 8 percent slopes
Ch	Chagrin loam
CkB	Clarksburg channery silt loam, 3 to 8 percent slopes
Lo	Lobdell loam
Mn	Massanetta silt loam
Tg	Tioga loam

TABLE 6.--LAND CAPABILITY CLASSES AND YIELDS PER ACRE OF CROPS AND PASTURE

(Yields are those that can be expected under a high level of management. Absence of a yield indicates that the soil is not suited to the crop or the crop generally is not grown on the soil)

Soil name and map symbol	Land capability	Corn	Oats	Wheat	Grass-legume hay	Alfalfa hay	Kentucky bluegrass
		Bu	Bu	Bu	Tons	Tons	AUM*
AgB------------- Allegheny	IIe	115	75	45	3.5	4.5	5.0
AgC------------- Allegheny	IIIe	105	70	40	3.5	4.0	4.5
BcC------------- Belmont-Cateache	IIIe	100	70	40	3.0	4.0	4.5
BcD------------- Belmont-Cateache	IVe	90	60	35	3.0	4.0	4.0
BeC------------- Belmont-Cateache	VIs	---	---	---	---	---	3.5
BeE, BeF, BeG--- Belmont-Cateache	VIIs	---	---	---	---	---	---
BkC------------- Berks	IIIe	75	55	35	2.5	3.0	4.0
BkD------------- Berks	IVe	70	50	30	2.5	3.0	3.5
BkE------------- Berks	VIe	---	---	---	---	---	2.5
BkF------------- Berks	VIIe	---	---	---	---	---	---
BmE, BmF, BmG--- Berks	VIIs	---	---	---	---	---	---
BnC------------- Berks-Weikert	IVe	65	50	30	2.5	2.5	3.0
BnD------------- Berks-Weikert	VIe	---	---	---	---	---	2.5
BnD3, BnF, BnF3, BnG, BnG3------ Berks-Weikert	VIIe	---	---	---	---	---	---
BrC------------- Blackthorn	IIIe	90	65	35	3.0	4.0	4.5
BrD------------- Blackthorn	IVe	80	60	30	2.5	3.5	4.0
BsC------------- Blackthorn	VIs	---	---	---	---	---	3.5

See footnotes at end of table.

TABLE 6.--LAND CAPABILITY CLASSES AND YIELDS PER ACRE OF CROPS AND PASTURE--Continued

Soil name and map symbol	Land capability	Corn	Oats	Wheat	Grass-legume hay	Alfalfa hay	Kentucky bluegrass
		Bu	Bu	Bu	Tons	Tons	AUM*
BsE, BsF-------- Blackthorn	VIIs	---	---	---	---	---	---
BtC**:							
Blackthorn-----	VIs	---	---	---	---	---	3.5
Dekalb---------	VIs	---	---	---	---	---	3.0
Elliber--------	VIs	---	---	---	---	---	4.0
BtE**----------- Blackthorn-Dekalb-Elliber	VIIs	---	---	---	---	---	---
BuB------------- Buchanan	IIe	100	65	40	3.0	3.5	4.5
BuC------------- Buchanan	IIIe	90	60	35	3.0	3.5	4.5
CaC------------- Calvin	IIIe	75	55	35	2.5	3.0	3.5
CaD------------- Calvin	IVe	70	50	30	2.0	3.0	3.0
CdC------------- Calvin-Dekalb-Hazleton	VIs	---	---	---	---	---	3.5
CdE, CdF, CdG--- Calvin-Dekalb-Hazleton	VIIs	---	---	---	---	---	---
CeC------------- Cateache	IIIe	90	65	35	3.0	4.0	4.5
CfC------------- Cateache	VIs	---	---	---	---	---	3.0
CfE, CfF, CfG--- Cateache	VIIs	---	---	---	---	---	---
Ch-------------- Chagrin	IIw	125	80	45	4.5	5.0	5.5
CkB------------- Clarksburg	IIe	100	70	40	3.0	3.5	4.5
CkC------------- Clarksburg	IIIe	90	65	40	3.0	3.5	4.5
ClC, ClD-------- Clarksburg	VIs	---	---	---	---	---	3.5
DeF------------- Dekalb-Elliber-Blackthorn	VIIs	---	---	---	---	---	---

See footnotes at end of table.

TABLE 6.--LAND CAPABILITY CLASSES AND YIELDS PER ACRE OF CROPS AND PASTURE--Continued

Soil name and map symbol	Land capability	Corn	Oats	Wheat	Grass-legume hay	Alfalfa hay	Kentucky bluegrass
		Bu	Bu	Bu	Tons	Tons	AUM*
DfG------------- Dekalb-Elliber	VIIs	---	---	---	---	---	---
Du-------------- Dunning	IIIw	100	60	---	4.0	---	4.5
EdC------------- Edom	IIIe	90	65	35	3.0	3.5	4.5
EdD------------- Edom	IVe	80	60	35	2.5	3.0	4.0
EdE------------- Edom	VIe	---	---	---	---	---	3.0
EdF------------- Edom	VIIe	---	---	---	---	---	---
ElC------------- Elliber	IVs	95	60	35	2.5	3.5	4.0
ElD------------- Elliber	VIs	---	---	---	---	---	3.5
ElE, ElF-------- Elliber	VIIs	---	---	---	---	---	---
ErB------------- Ernest	IIe	100	65	40	3.0	3.5	4.5
ErC------------- Ernest	IIIe	95	60	35	3.0	3.5	4.0
ErD------------- Ernest	IVe	90	55	35	2.5	3.0	3.5
GaC, GaE, GaF, GaG------------ Gauley	VIIs	---	---	---	---	---	---
HdC------------- Hazleton-Dekalb	VIs	---	---	---	---	---	3.0
HdE, HdF, HdG--- Hazleton-Dekalb	VIIs	---	---	---	---	---	---
LaC------------- Laidig	IIIe	95	65	35	3.0	4.0	4.5
LaD------------- Laidig	IVe	85	60	30	2.5	3.5	4.0
LdE, LeF-------- Laidig	VIIs	---	---	---	---	---	---
LgC------------- Laidig and Buchanan	VIs	---	---	---	---	---	3.5

See footnotes at end of table.

TABLE 6.--LAND CAPABILITY CLASSES AND YIELDS PER ACRE OF CROPS AND PASTURE--Continued

Soil name and map symbol	Land capability	Corn	Oats	Wheat	Grass-legume hay	Alfalfa hay	Kentucky bluegrass
		Bu	Bu	Bu	Tons	Tons	AUM*
LhC------------- Lehew and Dekalb	IIIe	75	55	35	2.5	3.0	4.0
LhD------------- Lehew and Dekalb	IVe	70	50	30	2.0	3.0	3.0
LkC------------- Lehew, Hazleton, and Dekalb	VIs	---	---	---	---	---	3.0
LkE, LkF, LkG--- Lehew, Hazleton, and Dekalb	VIIs	---	---	---	---	---	---
LmF**----------- Lithic Udorthents-Rock outcrop	VIIIe	---	---	---	---	---	---
Lo-------------- Lobdell	IIw	120	80	45	4.5	4.0	5.5
MaC------------- Mandy	IIIe	---	---	---	---	---	---
MaD------------- Mandy	IVe	---	---	---	---	---	---
MdE, MdF-------- Mandy	VIIs	---	---	---	---	---	---
Mn-------------- Massanetta	IIw	100	55	35	3.0	4.0	4.5
MoB------------- Monongahela	IIe	100	65	40	3.0	3.5	4.5
MoC------------- Monongahela	IIIe	90	60	35	3.0	3.0	4.5
OeC------------- Opequon	VIs	---	---	---	---	---	3.5
OeE, OeF, OeG--- Opequon	VIIs	---	---	---	---	---	---
OnC3------------ Opequon-Caneyville	VIe	---	---	---	---	---	3.5
OnD3, OnE3, OnF3 Opequon-Caneyville	VIIe	---	---	---	---	---	---
Or-------------- Orrville	IIIw	110	75	---	4.5	---	5.0

See footnotes at end of table.

TABLE 6.--LAND CAPABILITY CLASSES AND YIELDS PER ACRE OF CROPS AND PASTURE--Continued

Soil name and map symbol	Land capability	Corn	Oats	Wheat	Grass-legume hay	Alfalfa hay	Kentucky bluegrass
		Bu	Bu	Bu	Tons	Tons	AUM*
Po-------------- Potomac	IVs	---	---	---	2.5	3.0	3.5
Pt-------------- Potomac	Vs	---	---	---	2.0	2.5	2.5
Pu-------------- Purdy	IVw	80	55	---	2.5	---	4.0
Qu**------------ Quarry	VIIIs	---	---	---	---	---	---
Ro**------------ Rock outcrop and Rubble land	VIIIs	---	---	---	---	---	---
RuF------------- Rushtown	VIIe	---	---	---	---	---	---
ShC------------- Shouns	VIs	---	---	---	---	---	4.5
ShE------------- Shouns	VIIs	---	---	---	---	---	---
SnC, SnE, SnF--- Shouns	VIIs	---	---	---	---	---	---
SoC, SoE, SoF--- Shouns	VIIs	---	---	---	---	---	---
SrB------------- Simoda	VIIs	---	---	---	---	---	---
Tg-------------- Tioga	IIw	120	80	45	3.5	4.5	5.5
ToB------------- Toms	IIIw	80	50	---	3.0	---	5.0
TrC------------- Trussel	IIIe	---	---	---	---	---	---
TsC------------- Trussel	VIIs	---	---	---	---	---	---
TyB------------- Tygart	IIIw	95	60	---	3.0	---	4.5
Ud. Udorthents							

* Animal-unit-month: The amount of forage or feed required to feed one animal unit (one cow, one horse, one mule, five sheep, or five goats) for 30 days.

** See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 7.--CAPABILITY CLASSES AND SUBCLASSES

(Miscellaneous areas are excluded. Absence of an entry indicates no acreage)

Class	Total acreage	Major management concerns (subclass)		
		Erosion (e)	Wetness (w)	Soil problem (s)
		Acres	Acres	Acres
I	---	---	---	---
II	10,220	6,150	4,070	---
III	17,910	14,940	2,970	---
IV	20,560	13,610	210	6,740
V	8,030	---	---	8,030
VI	55,120	15,940	---	39,180
VII	327,770	60,770	---	267,000
VIII	4,160	500	---	3,660

TABLE 8.--WOODLAND MANAGEMENT AND PRODUCTIVITY

(Only the soils suitable for production of commercial trees are listed. Absence of an entry indicates that information was not available. When two entries are separated by a slash, the first is for south aspects and the second is for north aspects)

Soil name and map symbol	Ordination symbol	Management concerns				Potential productivity			Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Plant competition	Common trees	Site index	Productivity class*	
AgB, AgC-------- Allegheny	4A	Slight	Slight	Slight	Severe	Northern red oak----	80	4	Eastern white pine, yellow poplar, black walnut, white oak, northern red oak, black locust.
						Virginia pine-------	75	8	
						Black oak-----------	78	4	
						White oak-----------	80	4	
						Eastern white pine--	90	12	
BcC**:									
Belmont--------	4A	Slight	Slight	Slight	Severe	Northern red oak----	77	4	Eastern white pine, yellow poplar, black walnut, Japanese larch, black locust, red pine.
						White oak-----------	77	4	
						Sugar maple---------	80	4	
						Black cherry--------	80	4	
						Cucumbertree--------	80	---	
Cateache-------	4A	Slight	Slight	Slight	Moderate	Northern red oak----	80	4	Black cherry, Norway spruce, black locust, red pine.
						Black cherry--------	80	4	
						Cucumbertree--------	80	---	
						White oak-----------	80	4	
						Sugar maple---------	80	4	
BcD**:									
Belmont--------	4R	Moderate	Moderate	Moderate/slight	Severe	Northern red oak----	80	4	Eastern white pine, yellow poplar, black walnut, Japanese larch, black locust, red pine.
						White oak-----------	80	4	
						Sugar maple---------	80	4	
						Black cherry--------	80	4	
						Cucumbertree--------	80	---	
Cateache-------	4R	Moderate	Severe	Moderate/slight	Moderate	Northern red oak----	80	4	Black cherry, Norway spruce, black locust, red pine.
						Black cherry--------	80	4	
						Cucumbertree--------	80	---	
						White oak-----------	80	4	
						Sugar maple---------	80	4	
BeC**:									
Belmont--------	4A	Slight	Slight	Slight	Severe	Northern red oak----	77	4	Eastern white pine, yellow poplar, black walnut, Japanese larch, black locust, red pine.
						White oak-----------	77	4	
						Sugar maple---------	80	4	
						Black cherry--------	80	4	
						Cucumbertree--------	80	---	
Cateache-------	4A	Slight	Slight	Slight	Moderate	Northern red oak----	80	4	Black cherry, Norway spruce, black locust, red pine.
						Black cherry--------	80	4	
						Cucumbertree--------	80	---	
						White oak-----------	80	4	
						Sugar maple---------	80	4	

See footnotes at end of table.

TABLE 8.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns				Potential productivity			Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Plant competition	Common trees	Site index	Productivity class*	
BeE**: Belmont	4R	Moderate	Moderate	Moderate /slight	Severe	Northern red oak	80	4	Eastern white pine, yellow poplar, black walnut, Japanese larch, black locust, red pine.
						White oak	80	4	
						Sugar maple	80	4	
						Black cherry	80	4	
						Cucumbertree	80	---	
Cateache	4R	Moderate	Severe	Moderate /slight	Moderate	Northern red oak	80	4	Black cherry, Norway spruce, black locust, red pine.
						Black cherry	80	4	
						Cucumbertree	80	---	
						White oak	80	4	
						Sugar maple	80	4	
BeF**, BeG**: Belmont***	4R	Severe	Severe	Moderate /slight	Severe	Northern red oak	80	4	Eastern white pine, yellow poplar, black walnut, Japanese larch, black locust, red pine.
						White oak	80	4	
						Sugar maple	80	4	
						Black cherry	80	4	
						Cucumbertree	80	---	
Cateache***	4R	Severe	Severe	Moderate /slight	Moderate	Northern red oak	80	4	Black cherry, Norway spruce, black locust, red pine.
						Black cherry	80	4	
						Cucumbertree	80	---	
						White oak	80	4	
						Sugar maple	80	4	
BkC Berks	3F	Slight	Slight	Moderate	Moderate	Northern red oak	60	3	Virginia pine, eastern white pine, Japanese larch, Norway spruce, Scotch pine.
						Black oak	60	3	
						Virginia pine	60	6	
						Chestnut oak	---	---	
						White oak	60	3	
BkD, BkE Berks	2R/3R	Moderate	Moderate	Moderate	Moderate	Northern red oak	50/60	2/3	Virginia pine, eastern white pine, Japanese larch, Norway spruce, Scotch pine.
						Black oak	50/60	2/3	
						Virginia pine	50/60	5/6	
						Chestnut oak	---	---	
						White oak	50/60	2/3	
BkF Berks	2R/3R	Severe	Severe	Moderate	Moderate	Northern red oak	50/60	2/3	Virginia pine, eastern white pine, Japanese larch, Norway spruce, Scotch pine.
						Black oak	50/60	2/3	
						Virginia pine	50/60	5/6	
						Chestnut oak	---	---	
						White oak	50/60	2/3	
BmE Berks	2R/3R	Moderate	Moderate	Moderate	Moderate	Northern red oak	50/60	2/3	Virginia pine, eastern white pine, Japanese larch, Norway spruce, Scotch pine.
						Black oak	50/60	2/3	
						Virginia pine	50/60	5/6	
						Chestnut oak	---	---	
						White oak	50/60	2/3	

See footnotes at end of table.

TABLE 8.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns				Potential productivity			Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Plant competition	Common trees	Site index	Productivity class*	
BmF, BmG Berks***	2R/3R	Severe	Severe	Moderate	Moderate	Northern red oak	50/60	2/3	Virginia pine, eastern white pine, Japanese larch, Norway spruce, Scotch pine.
						Black oak	50/60	2/3	
						Virginia pine	50/60	5/6	
						Chestnut oak	---	---	
						White oak	50/60	2/3	
BnC**: Berks	3F	Slight	Slight	Moderate	Moderate	Northern red oak	60	3	Virginia pine, eastern white pine, Japanese larch, Norway spruce, Scotch pine.
						Black oak	60	3	
						Virginia pine	60	6	
						Chestnut oak	---	---	
						White oak	60	3	
Weikert	2D	Slight	Slight	Severe	Slight	Northern red oak	50	2	Virginia pine, eastern white pine, Scotch pine.
						Virginia pine	50	5	
						Chestnut oak	---	---	
						White oak	50	2	
						Black oak	50	2	
BnD**: Berks	2R/3R	Moderate	Moderate	Moderate	Moderate	Northern red oak	50/60	2/3	Virginia pine, eastern white pine, Japanese larch, Norway spruce, red pine, Scotch pine.
						Black oak	50/60	2/3	
						Virginia pine	50/60	5/6	
						Chestnut oak	---	---	
						White oak	50/60	2/3	
Weikert	2R	Moderate	Moderate	Severe	Slight	Northern red oak	40/50	2	Eastern white pine, Virginia pine, Scotch pine.
						Virginia pine	40/50	3/5	
						Chestnut oak	---	---	
						White oak	40/50	2	
						Black oak	40/50	2	
BnD3 Berks	2R/3R	Moderate	Severe	Moderate	Moderate	Northern red oak	50/60	2/3	Virginia pine, eastern white pine, Japanese larch, Norway spruce, Scotch pine.
						Black oak	50/60	2/3	
						Virginia pine	50/60	5/6	
						Chestnut oak	---	---	
						White oak	50/60	2/3	
Weikert	2R	Moderate	Severe	Severe	Slight	Northern red oak	40/50	2	Eastern white pine, Virginia pine, Scotch pine.
						Virginia pine	40/50	3/5	
						Chestnut oak	---	---	
						White oak	40/50	2	
						Black oak	40/50	2	
BnF**, BnF3**, BnG**, BnG3**: Berks***	2R/3R	Severe	Severe	Moderate	Moderate	Northern red oak	50/60	2/3	Virginia pine, eastern white pine, Japanese larch, Norway spruce, red pine, Scotch pine.
						Black oak	50/60	2/3	
						Virginia pine	50/60	5/6	
						Chestnut oak	---	---	
						White oak	50/60	2/3	

See footnotes at end of table.

TABLE 8.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns				Potential productivity			Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Plant competition	Common trees	Site index	Productivity class*	
BnF**, BnF3** BnG**, BnG3**: Weikert***	2R	Severe	Severe	Severe	Slight	Northern red oak	40/50	2	Eastern white pine, Virginia pine, Scotch pine.
						Virginia pine	40/50	3/5	
						Chestnut oak	---	---	
						White oak	40/50	2	
						Black oak	40/50	2	
BrC Blackthorn	4F	Slight	Slight	Slight	Moderate	Northern red oak	70	4	Eastern white pine, yellow poplar, black walnut, Norway spruce, Japanese larch, black locust.
						White oak	70	4	
						Eastern white pine	80	10	
						Yellow poplar	75	4	
						Black walnut	---	---	
BrD Blackthorn	4R	Moderate	Moderate	Moderate /slight	Moderate	Northern red oak	70	4	Eastern white pine, yellow poplar, black walnut, Norway spruce, Japanese larch, black locust.
						White oak	70	4	
						Eastern white pine	80	10	
						Yellow poplar	75	4	
						Black walnut	---	---	
BsC Blackthorn	4F	Slight	Slight	Slight	Moderate	Northern red oak	70	4	Eastern white pine, yellow poplar, black walnut, Norway spruce, Japanese larch, black locust.
						White oak	70	4	
						Eastern white pine	80	10	
						Yellow poplar	75	4	
						Black walnut	---	---	
BsE Blackthorn	4R	Moderate	Moderate	Moderate /slight	Moderate	Northern red oak	70	4	Eastern white pine, yellow poplar, black walnut, Norway spruce, Japanese larch, black locust.
						White oak	70	4	
						Eastern white pine	80	10	
						Yellow poplar	75	4	
						Black walnut	---	---	
BsF Blackthorn	4R	Severe	Severe	Moderate /slight	Moderate	Northern red oak	70	4	Eastern white pine, yellow poplar, black walnut, Norway spruce, Japanese larch, black locust.
						White oak	70	4	
						Eastern white pine	80	10	
						Yellow poplar	75	4	
						Black walnut	---	---	

See footnotes at end of table.

TABLE 8.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns				Potential productivity			Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Plant competition	Common trees	Site index	Productivity class*	
BtC**:									
Blackthorn-----	4F	Slight	Slight	Slight	Moderate	Northern red oak----	70	4	Eastern white pine, yellow poplar, black walnut, Norway spruce, Japanese larch, black locust.
						White oak-----------	70	4	
						Eastern white pine--	80	10	
						Yellow poplar-------	75	4	
						Black walnut--------	---	---	
Dekalb---------	3F	Slight	Slight	Moderate	Moderate	Northern red oak----	57	3	Eastern white pine, Austrian pine, Japanese larch, Virginia pine, Norway spruce, Scotch pine.
						Chestnut oak--------	---	---	
						Virginia pine-------	60	6	
						White oak-----------	60	3	
						Black oak-----------	60	3	
Elliber--------	5F	Slight	Slight	Slight	Severe	Northern red oak----	85	5	Eastern white pine, Norway spruce, yellow poplar, black walnut, black locust.
						White oak-----------	85	5	
						Eastern white pine--	95	12	
						Black locust--------	---	---	
BtE**:									
Blackthorn-----	4R	Moderate	Moderate	Moderate /slight	Moderate	Northern red oak----	70	4	Eastern white pine, yellow poplar, black walnut, Norway spruce, Japanese larch, black locust.
						White oak-----------	70	4	
						Eastern white pine--	80	10	
						Yellow poplar-------	75	4	
						Black walnut--------	---	---	
Dekalb---------	2R/3R	Moderate	Moderate	Moderate	Moderate	Northern red oak----	52/57	2/3	Eastern white pine, Virginia pine, Norway spruce, Austrian pine, Japanese larch, Scotch pine.
						Chestnut oak--------	---	---	
						Virginia pine-------	50/60	5/6	
						White oak-----------	50/60	2/3	
						Black oak-----------	50/60	2/3	
Elliber--------	4R/5R	Moderate	Moderate	Moderate /slight	Moderate /severe	Northern red oak----	80/85	4/5	Eastern white pine, Norway spruce, black walnut, yellow poplar, black locust.
						White oak-----------	80/85	4/5	
						Eastern white pine--	90/95	12	
						Black locust--------	---	---	
BuB, BuC-------- Buchanan	3A	Slight	Slight	Slight	Moderate	Northern red oak----	66	3	Eastern white pine, Virginia pine, Japanese larch, Norway spruce, yellow poplar.
						White oak-----------	66	3	
						Black oak-----------	66	3	
						Eastern white pine--	80	10	

See footnotes at end of table.

TABLE 8.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns				Potential productivity			Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Plant competition	Common trees	Site index	Productivity class*	
CaC Calvin	3F	Slight	Slight	Moderate	Moderate	Northern red oak	60	3	Eastern white pine, Virginia pine, Japanese larch, Norway spruce, Scotch pine.
						Chestnut oak	---	---	
						Virginia pine	60	6	
						Black oak	60	3	
						White oak	60	3	
CaD Calvin	2R/3R	Moderate	Moderate	Moderate	Moderate	Northern red oak	50/60	2/3	Eastern white pine, Virginia pine, Japanese larch, Norway spruce, Scotch pine.
						Chestnut oak	---	---	
						Virginia pine	50/60	5/6	
						Black oak	50/60	2/3	
						White oak	50/60	2/3	
CdC**:									
Calvin	3F	Slight	Slight	Moderate	Moderate	Northern red oak	60	3	Eastern white pine, Virginia pine, Japanese larch, Norway spruce, Scotch pine.
						Chestnut oak	---	---	
						Virginia pine	60	6	
						Black oak	60	3	
						White oak	60	3	
Dekalb	3F	Slight	Slight	Moderate	Moderate	Northern red oak	57	3	Eastern white pine, Austrian pine, Japanese larch, Virginia pine, Norway spruce, Scotch pine.
						Chestnut oak	---	---	
						Virginia pine	60	6	
						White oak	60	3	
						Black oak	60	3	
Hazleton	4F	Slight	Slight	Slight	Moderate	Northern red oak	70	4	Japanese larch, eastern white pine, Norway spruce, Austrian pine, Virginia pine, Scotch pine.
						White oak	70	4	
						Chestnut oak	---	---	
						Virginia pine	70	8	
						Black oak	70	4	
CdE**:									
Calvin	2R/3R	Moderate	Moderate	Moderate	Moderate	Northern red oak	50/60	2/3	Eastern white pine, Virginia pine, Japanese larch, Norway spruce, Scotch pine.
						Chestnut oak	---	---	
						Virginia pine	50/60	5/6	
						Black oak	50/60	2/3	
						White oak	50/60	2/3	
Dekalb	2R/3R	Moderate	Moderate	Moderate	Moderate	Northern red oak	52/57	2/3	Eastern white pine, Virginia pine, Norway spruce, Austrian pine, Japanese larch, Scotch pine.
						Chestnut oak	---	---	
						Virginia pine	50/60	5/6	
						White oak	50/60	2/3	
						Black oak	50/60	2/3	
Hazleton	3R/4R	Moderate	Moderate	Moderate /slight	Moderate	Northern red oak	60/70	3/4	Japanese larch, eastern white pine, Norway spruce, Austrian pine, Virginia pine, Scotch pine.
						White oak	60/70	3/4	
						Chestnut oak	---	---	
						Virginia pine	60/70	6/8	
						Black oak	60/70	3/4	

See footnotes at end of table.

TABLE 8.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns				Potential productivity			Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Plant competition	Common trees	Site index	Productivity class*	
CdF**, CdG**:									
Calvin***	2R/3R	Severe	Severe	Moderate	Moderate	Northern red oak	50/60	2/3	Eastern white pine, Virginia pine, Japanese larch, Norway spruce, Scotch pine.
						Chestnut oak	---	---	
						Virginia pine	50/60	5/6	
						Black oak	50/60	2/3	
						White oak	50/60	2/3	
Dekalb***	2R/3R	Severe	Severe	Moderate	Moderate	Northern red oak	52/57	2/3	Eastern white pine, Virginia pine, Norway spruce, Austrian pine, Japanese larch, Scotch pine.
						Chestnut oak	---	---	
						Virginia pine	50/60	5/6	
						White oak	50/60	2/3	
						Black oak	50/60	2/3	
Hazleton***	3R/4R	Severe	Severe	Moderate /slight	Moderate	Northern red oak	60/70	3/4	Japanese larch, eastern white pine, Norway spruce, Austrian pine, Virginia pine, Scotch pine.
						White oak	60/70	3/4	
						Chestnut oak	---	---	
						Virginia pine	60/70	6/8	
						Black oak	60/70	3/4	
CeC, CfC Cateache	4A	Slight	Slight	Slight	Moderate	Northern red oak	80	4	Black cherry, Norway spruce, black locust, red pine.
						Black cherry	80	4	
						Cucumbertree	80	---	
						White oak	80	4	
						Sugar maple	80	4	
CfE Cateache	4R	Moderate	Severe	Moderate /slight	Moderate	Northern red oak	70/80	4	Black cherry, Norway spruce, black locust, red pine.
						Black cherry	70/80	3/4	
						Cucumbertree	70/80	---	
						White oak	70/80	4	
						Sugar maple	70/80	3/4	
CfF, CfG Cateache***	4R	Severe	Severe	Moderate /slight	Moderate	Northern red oak	70/80	4	Black cherry, Norway spruce, black locust, red pine.
						Black cherry	70/80	3/4	
						Cucumbertree	70/80	---	
						White oak	70/80	4	
						Sugar maple	70/80	3/4	
Ch Chagrin	5A	Slight	Slight	Slight	Severe	Northern red oak	86	5	Eastern white pine, black walnut, yellow poplar, northern red oak, white oak, black locust.
						Yellow poplar	96	7	
						Sugar maple	86	4	
						White oak	---	---	
						Black cherry	---	---	
						Black walnut	---	---	
CkB, CkC Clarksburg	4A	Slight	Slight	Slight	Moderate	Northern red oak	75	4	Eastern white pine, yellow poplar, Japanese larch, Norway spruce.
						White oak	75	4	
						Black walnut	---	---	
						Eastern redcedar	---	---	

See footnotes at end of table.

TABLE 8.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns				Potential productivity			Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Plant competition	Common trees	Site index	Productivity class*	
ClC: Clarksburg	4A	Slight	Slight	Slight	Moderate	Northern red oak	75	4	Eastern white pine, Norway spruce, yellow poplar, Japanese larch.
						White oak	75	4	
						Black walnut	---	---	
						Eastern redcedar	---	---	
ClD: Clarksburg	4R	Moderate	Moderate	Moderate /slight	Moderate	Northern red oak	75	4	Eastern white pine, Norway spruce, yellow poplar, Japanese larch.
						White oak	75	4	
						Black walnut	---	---	
						Eastern redcedar	---	---	
DeF**:									
Dekalb	2R/3R	Severe	Severe	Moderate	Moderate	Northern red oak	52/57	2/3	Eastern white pine, Virginia pine, Norway spruce, Austrian pine, Japanese larch, Scotch pine.
						Chestnut oak	---	---	
						Virginia pine	50/60	5/6	
						White oak	50/60	2/3	
						Black oak	50/60	2/3	
Elliber	4R/5R	Severe	Severe	Moderate /slight	Moderate /severe	Northern red oak	80/85	4/5	Eastern white pine, Norway spruce, black walnut, yellow poplar, black locust.
						White oak	80/85	4/5	
						Eastern white pine	90/95	12	
						Black locust	---	---	
Blackthorn	4R	Severe	Severe	Moderate /slight	Moderate	Northern red oak	70	4	Eastern white pine, yellow poplar, black walnut, Norway spruce, Japanese larch, black locust.
						White oak	70	4	
						Eastern white pine	80	10	
						Yellow poplar	75	4	
						Black walnut	---	---	
DfG**:									
Dekalb***	2R/3R	Severe	Severe	Moderate	Moderate	Northern red oak	52/57	2/3	Eastern white pine, Virginia pine, Norway spruce, Austrian pine, Japanese larch, Scotch pine.
						Chestnut oak	---	---	
						Virginia pine	50/60	5/6	
						White oak	50/60	2/3	
						Black oak	50/60	2/3	
Elliber***	4R/5R	Severe	Severe	Moderate /slight	Moderate /severe	Northern red oak	80/85	4/5	Eastern white pine, Norway spruce, black walnut, yellow poplar, black locust.
						White oak	80/85	4/5	
						Eastern white pine	90/95	12	
						Black locust	---	---	

See footnotes at end of table.

TABLE 8.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns				Potential productivity			Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Plant competition	Common trees	Site index	Productivity class*	
Du Dunning	5W	Slight	Severe	Severe	Severe	Pin oak	95	5	Pin oak, American sycamore, sweetgum, red maple, Virginia pine.
						American sycamore	---	---	
						Sugar maple	90	4	
EdC Edom	4A	Slight	Slight	Slight	Severe	Northern red oak	70	4	Eastern white pine, yellow poplar, Norway spruce, Virginia pine, black locust.
						White oak	70	4	
						Black walnut	---	---	
						Eastern redcedar	---	---	
EdD, EdE Edom	4R	Moderate	Moderate	Moderate/slight	Severe	Northern red oak	70	4	Eastern white pine, yellow poplar, Norway spruce, Virginia pine, black locust.
						White oak	70	4	
						Black walnut	---	---	
						Eastern redcedar	---	---	
EdF Edom	4R	Severe	Severe	Moderate/slight	Severe	Northern red oak	70	4	Eastern white pine, yellow poplar, Norway spruce, Virginia pine, black locust.
						White oak	70	4	
						Black walnut	---	---	
						Eastern redcedar	---	---	
ElC Elliber	5F	Slight	Slight	Slight	Severe	Northern red oak	85	5	Eastern white pine, Norway spruce, black walnut, yellow poplar, black locust.
						White oak	85	5	
						Eastern white pine	95	12	
						Black locust	---	---	
ElD, ElE Elliber	4R/5R	Moderate	Moderate	Moderate/slight	Moderate/severe	Northern red oak	80/85	4/5	Eastern white pine, Norway spruce, black walnut, yellow poplar, black locust.
						White oak	80/85	4/5	
						Eastern white pine	90/95	12	
						Black locust	---	---	
ElF Elliber	4R/5R	Severe	Severe	Moderate/slight	Moderate/severe	Northern red oak	80/85	4/5	Eastern white pine, Norway spruce, black walnut, yellow poplar, black locust.
						White oak	80/85	4/5	
						Eastern white pine	90/95	12	
						Black locust	---	---	
ErB Ernest	4A	Slight	Slight	Slight	Moderate	Northern red oak	70	4	Eastern white pine, Virginia pine, Norway spruce, Japanese larch, yellow poplar.
						White oak	70	4	
						Sugar maple	70	3	
						Eastern white pine	80	10	

See footnotes at end of table.

TABLE 8.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns				Potential productivity			Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Plant competition	Common trees	Site index	Productivity class*	
ErC Ernest	4A	Moderate	Slight	Slight	Moderate	Northern red oak	70	4	Eastern white pine, Virginia pine, Norway spruce, Japanese larch, yellow poplar.
						White oak	70	4	
						Sugar maple	70	3	
						Eastern white pine	80	10	
ErD Ernest	4R	Moderate	Moderate	Moderate /slight	Moderate	Northern red oak	70	4	Eastern white pine, Virginia pine, Norway spruce, Japanese larch, yellow poplar.
						White oak	70	4	
						Sugar maple	70	3	
						Eastern white pine	80	10	
GaC Gauley	6X	Slight	Severe	Severe	Severe	Red spruce	42	6	Red spruce, Norway spruce, eastern white pine, red pine, Austrian pine, red maple.
						Yellow birch	---	---	
						Red maple	---	---	
GaE Gauley	6R	Moderate	Severe	Severe	Severe	Red spruce	42	6	Red spruce, Norway spruce, eastern white pine, red pine, Austrian pine, red maple.
						Yellow birch	---	---	
						Red maple	---	---	
GaF, GaG Gauley***	6R	Severe	Severe	Severe	Severe	Red spruce	42	6	Red spruce, Norway spruce, eastern white pine, red pine, Austrian pine, red maple.
						Yellow birch	---	---	
						Red maple	---	---	
HdC**:									
Hazleton	4F	Slight	Slight	Slight	Moderate	Northern red oak	70	4	Japanese larch, eastern white pine, Norway spruce, Austrian pine, Virginia pine, Scotch pine.
						White oak	70	4	
						Chestnut oak	---	---	
						Virginia pine	70	8	
						Black oak	70	4	
Dekalb	3F	Slight	Slight	Moderate	Moderate	Northern red oak	57	3	Eastern white pine, Austrian pine, Japanese larch, Virginia pine, Norway spruce, Scotch pine.
						Chestnut oak	---	---	
						Virginia pine	60	6	
						White oak	60	3	
						Black oak	60	3	

See footnotes at end of table.

TABLE 8.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns				Potential productivity			Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Plant competition	Common trees	Site index	Productivity class*	
HdE**:									
Hazleton-------	3R/4R	Moderate	Moderate	Moderate /slight	Moderate	Northern red oak----	60/70	3/4	Japanese larch, eastern white pine, Norway spruce, Austrian pine, Virginia pine, Scotch pine.
						White oak-----------	60/70	3/4	
						Chestnut oak--------	---	---	
						Virginia pine-------	60/70	6	
						Black oak-----------	60/70	3/4	
Dekalb---------	2R/3R	Moderate	Moderate	Moderate	Moderate	Northern red oak----	52/57	2/3	Eastern white pine, Virginia pine, Norway spruce, Austrian pine, Japanese larch, Scotch pine.
						Chestnut oak--------	---	---	
						Virginia pine-------	50/60	5/6	
						White oak-----------	50/60	2/3	
						Black oak-----------	50/60	2/3	
HdF**, HdG**:									
Hazleton***----	3R/4R	Severe	Severe	Moderate /slight	Moderate	Northern red oak----	60/70	3/4	Japanese larch, eastern white pine, Norway spruce, Austrian pine, Virginia pine, Scotch pine.
						White oak-----------	60/70	3/4	
						Chestnut oak--------	---	---	
						Virginia pine-------	60/70	6/8	
						Black oak-----------	60/70	3/4	
Dekalb***------	2R/3R	Severe	Severe	Moderate	Moderate	Northern red oak----	52/57	2/3	Eastern white pine, Virginia pine, Norway spruce, Austrian pine, Japanese larch, Scotch pine.
						Chestnut oak--------	---	---	
						Virginia pine-------	50/60	5/6	
						White oak-----------	50/60	2/3	
						Black oak-----------	50/60	2/3	
LaC------------- Laidig	4A	Slight	Slight	Slight	Moderate	Northern red oak----	71	4	Eastern white pine, yellow poplar, black walnut, Virginia pine, Japanese larch, Norway spruce, black locust.
						Eastern white pine--	80	10	
						Virginia pine-------	70	8	
						Black oak-----------	70	4	
						White oak-----------	70	4	
LaD, LdE-------- Laidig	4R	Moderate	Moderate	Moderate /slight	Moderate	Northern red oak----	71	4	Eastern white pine, yellow poplar, black walnut, Virginia pine, Japanese larch, Norway spruce, black locust.
						Eastern white pine--	80	10	
						Virginia pine-------	70	8	
						Black oak-----------	70	4	
						White oak-----------	70	4	

See footnotes at end of table.

TABLE 8.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns				Potential productivity			Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Plant competition	Common trees	Site index	Productivity class*	
LeF Laidig	4R	Severe	Severe	Moderate /slight	Moderate	Northern red oak	70	4	Eastern white pine, yellow poplar, black walnut, Virginia pine, Japanese larch, Norway spruce, black locust.
						Eastern white pine	80	10	
						Virginia pine	70	8	
						Black oak	70	4	
						White oak	70	4	
LgC**:									
Laidig	4A	Slight	Slight	Slight	Moderate	Northern red oak	71	4	Eastern white pine, yellow poplar, black walnut, Virginia pine, Japanese larch, Norway spruce, black locust.
						Eastern white pine	80	10	
						Virginia pine	70	8	
						Black oak	70	4	
						White oak	70	4	
Buchanan	3A	Slight	Slight	Slight	Moderate	Northern red oak	66	3	Eastern white pine, Virginia pine, Japanese larch, Norway spruce, yellow poplar.
						White oak	66	3	
						Black oak	66	3	
						Eastern white pine	80	10	
LhC**:									
Lehew	3F	Slight	Slight	Moderate	Moderate	Northern red oak	57	3	Eastern white pine, Virginia pine, Japanese larch, Austrian pine, Norway spruce, Scotch pine.
						Chestnut oak	---	---	
						Virginia pine	60	6	
						White oak	60	3	
						Black oak	60	3	
Dekalb	3F	Slight	Slight	Moderate	Moderate	Northern red oak	57	3	Eastern white pine, Virginia pine, Austrian pine, Japanese larch, Virginia pine, Norway spruce, Scotch pine.
						Chestnut oak	---	---	
						Virginia pine	60	6	
						White oak	60	3	
						Black oak	60	3	
LhD**:									
Lehew	2R/3R	Moderate	Moderate	Moderate	Moderate	Northern red oak	50/62	2/3	Eastern white pine, Virginia pine, Japanese larch, Austrian pine, Norway spruce, Scotch pine.
						Virginia pine	50/57	5/6	
						White oak	50/60	2/3	
						Chestnut oak	---	---	
						Black oak	50/60	2/3	

See footnotes at end of table.

TABLE 8.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns				Potential productivity			Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Plant competition	Common trees	Site index	Productivity class*	
LhD**: Dekalb	2R/3R	Moderate	Moderate	Moderate	Moderate	Northern red oak	52/57	2/3	Eastern white pine, Virginia pine, Norway spruce, Austrian pine, Japanese larch, Scotch pine.
						Chestnut oak	---	---	
						Virginia pine	50/60	5/6	
						White oak	50/60	2/3	
						Black oak	50/60	2/3	
LkC**: Lehew	3F	Slight	Slight	Moderate	Moderate	Northern red oak	62	3	Eastern white pine, Virginia pine, Japanese larch, Austrian pine, Norway spruce, Scotch pine.
						Virginia pine	57	6	
						White oak	60	3	
						Chestnut oak	---	---	
						Black oak	60	3	
Hazleton	4F	Slight	Slight	Slight	Moderate	Northern red oak	70	4	Japanese larch, eastern white pine, Norway spruce, Austrian pine, Virginia pine, Scotch pine.
						White oak	70	4	
						Chestnut oak	---	---	
						Virginia pine	70	8	
						Black oak	70	4	
Dekalb	3F	Slight	Slight	Moderate	Moderate	Northern red oak	57	3	Eastern white pine, Austrian pine, Japanese larch, Virginia pine, Norway spruce, Scotch pine.
						Chestnut oak	---	---	
						Virginia pine	60	6	
						White oak	60	3	
						Black oak	60	3	
LkE**: Lehew	2R/3R	Moderate	Moderate	Moderate	Moderate	Northern red oak	50/62	2/3	Eastern white pine, Virginia pine, Japanese larch, Austrian pine, Norway spruce, Scotch pine.
						Virginia pine	50/60	5/6	
						White oak	50/60	2/3	
						Chestnut oak	---	---	
						Black oak	50/60	2/3	
Hazleton	3R/4R	Moderate	Moderate	Moderate /slight	Moderate	Northern red oak	60/70	3/4	Japanese larch, eastern white pine, Norway spruce, Austrian pine, Virginia pine, Scotch pine.
						White oak	60/70	3/4	
						Chestnut oak	---	---	
						Virginia pine	60/70	6/8	
						Black oak	60/70	3/4	

See footnotes at end of table.

TABLE 8.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns				Potential productivity			Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Plant competition	Common trees	Site index	Productivity class*	
LkE**:									
Dekalb---------	2R/3R	Moderate	Moderate	Moderate	Moderate	Northern red oak----	52/57	2/3	Eastern white pine, Virginia pine, Norway spruce, Austrian pine, Japanese larch, Scotch pine.
						Chestnut oak--------	---	---	
						Virginia pine-------	50/60	5/6	
						White oak-----------	50/60	2/3	
						Black oak-----------	50/60	2/3	
LkF**, LkG**:									
Lehew***--------	2R/3R	Severe	Severe	Moderate	Moderate	Northern red oak----	50/62	2/3	Eastern white pine, Virginia pine, Japanese larch, Austrian pine, Norway spruce, Scotch pine.
						Virginia pine-------	50/60	5/6	
						White oak-----------	50/60	2/3	
						Chestnut oak--------	---	---	
						Black oak-----------	50/60	2/3	
Hazleton***-----	3R/4R	Severe	Severe	Moderate /slight	Moderate	Northern red oak----	60/70	3/4	Japanese larch, eastern white pine, Norway spruce, Austrian pine, Virginia pine, Scotch pine.
						White oak-----------	60/70	3/4	
						Chestnut oak--------	---	---	
						Virginia pine-------	60/70	6/8	
						Black oak-----------	60/70	3/4	
Dekalb***-------	2R/3R	Severe	Severe	Moderate	Moderate	Northern red oak----	52/57	2/3	Eastern white pine, Virginia pine, Norway spruce, Austrian pine, Japanese larch, Scotch pine.
						Chestnut oak--------	---	---	
						Virginia pine-------	50/60	5/6	
						White oak-----------	50/60	2/3	
						Black oak-----------	50/60	2/3	
LmF**:									
Lithic Udorthents----	---	Severe	Severe	Severe	Slight	Virginia pine-------	---	---	Virginia pine.
						Chestnut oak--------	---	---	
						Scrub oak-----------	---	---	
Rock outcrop.									
Lo-------------- Lobdell	5A	Slight	Slight	Slight	Severe	Northern red oak----	87	5	Eastern white pine, white oak, yellow poplar, northern red oak, black locust.
						Yellow poplar-------	96	7	
						Sugar maple---------	85	4	
						White oak-----------	90	5	
						Black cherry--------	85	4	
						Black walnut--------	---	---	
MaC------------- Mandy	4F	Slight	Slight	Slight	Moderate	Black cherry--------	80	4	Black cherry, red pine, Norway spruce, red spruce, red maple.
						Red maple-----------	---	---	
						Red spruce----------	65	10	
						American beech------	---	---	

See footnotes at end of table.

TABLE 8.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns				Potential productivity			Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Plant competition	Common trees	Site index	Productivity class*	
MaD, MdE Mandy	4R	Moderate	Moderate	Moderate /slight	Moderate	Black cherry Red maple Red spruce American beech	80 --- 65 ---	4 --- 10 ---	Black cherry, red pine, Norway spruce, red spruce, red maple.
MdF Mandy	4R	Severe	Severe	Moderate /slight	Moderate	Black cherry Red maple Red spruce American beech	80 --- 65 ---	4 --- 10 ---	Black cherry, red pine, Norway spruce, red spruce, red maple.
Mn Massanetta	5A	Slight	Slight	Slight	Severe	Northern red oak White oak Eastern redcedar Black walnut	85 85 --- ---	5 5 --- ---	Black walnut, eastern white pine, yellow poplar, black locust.
MoB Monongahela	4A	Slight	Slight	Slight	Moderate	Northern red oak Eastern white pine Virginia pine White oak	70 72 66 70	4 9 7 4	Eastern white pine, Virginia pine, yellow poplar, Japanese larch, Norway spruce.
MoC Monongahela	4A	Moderate	Slight	Slight	Moderate	Northern red oak Eastern white pine Virginia pine White oak	70 72 66 70	4 9 7 4	Eastern white pine, Virginia pine, yellow poplar, Japanese larch, Norway spruce.
OeC Opequon	3X	Moderate	Severe	Severe	Moderate	Northern red oak White oak Black walnut Eastern redcedar	60 60 --- ---	3 3 --- ---	Virginia pine, eastern white pine, black locust, Scotch pine.
OeE Opequon	2R/3R	Severe	Severe	Severe	Moderate	Northern red oak White oak Black walnut Eastern redcedar	50/60 50/60 --- ---	2/3 2/3 --- ---	Virginia pine, eastern white pine, black locust, Scotch pine.
OeF, OeG Opequon***	2R/3R	Severe	Severe	Severe	Moderate	Northern red oak White oak Black walnut Eastern redcedar	50/60 50/60 --- ---	2/3 2/3 --- ---	Virginia pine, eastern white pine, black locust, Scotch pine.
OnC3**: Opequon	3C	Moderate	Severe	Severe	Moderate	Northern red oak White oak Black walnut Eastern redcedar	60 60 --- ---	3 3 --- ---	Virginia pine, eastern white pine, black locust, Scotch pine.

See footnotes at end of table.

TABLE 8.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns				Potential productivity			Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Plant competition	Common trees	Site index	Productivity class*	
OnC3**:									
Caneyville	4C	Moderate	Moderate	Moderate	Moderate	Red oak	70	4	Virginia pine, black locust, eastern white pine, Scotch pine.
						White oak	70	4	
						Eastern redcedar	36	---	
						Black walnut	---	---	
OnD3**									
Opequon	2R/3R	Moderate	Severe	Severe	Moderate	Northern red oak	50/60	2/3	Virginia pine, eastern white pine, black locust, Scotch pine.
						White oak	50/60	2/3	
						Black walnut	---	---	
						Eastern redcedar	---	---	
Caneyville	3R/4R	Moderate	Severe	Moderate	Moderate	Red oak	65/70	3/4	Virginia pine, black locust, eastern white pine, Scotch pine.
						White oak	65/70	3/4	
						Eastern redcedar	---	---	
						Black walnut	---	---	
OnE3**, OnF3**:									
Opequon	2R/3R	Severe	Severe	Severe	Moderate	Northern red oak	50/60	2/3	Virginia pine, eastern white pine, black locust, Scotch pine.
						White oak	50/60	2/3	
						Black walnut	---	---	
						Eastern redcedar	---	---	
Caneyville	3R/4R	Severe	Severe	Moderate	Moderate	Red oak	65/70	3/4	Virginia pine, black locust, eastern white pine, Scotch pine.
						White oak	65/70	3/4	
						Eastern redcedar	---	---	
						Black walnut	---	---	
Or Orrville	5W	Slight	Moderate	Slight	Severe	Pin oak	85	5	Eastern white pine, yellow poplar, Scotch pine, Norway spruce, black locust, American sycamore, red maple.
						Northern red oak	80	4	
						Sugar maple	80	4	
Po, Pt Potomac	4F	Slight	Slight	Moderate	Moderate	Northern red oak	70	4	Northern red oak, white oak, American sycamore, black walnut, eastern white pine, Japanese larch, yellow poplar.
						White oak	70	4	
						Eastern white pine	80	10	
						Black walnut	---	---	
						American sycamore	---	---	
						Eastern redcedar	---	---	
Pu Purdy	5W	Slight	Severe	Severe	Severe	Pin oak	85	5	Virginia pine, pin oak, American sycamore, red maple.
						Virginia pine	75	8	
						American sycamore	---	---	

See footnotes at end of table.

TABLE 8.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns				Potential productivity			Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Plant competition	Common trees	Site index	Productivity class*	
RuF------------- Rushtown	3R	Severe	Severe	Moderate	Moderate	Northern red oak----	60	3	Eastern white pine, Virginia pine, Japanese larch, Norway spruce, Scotch pine.
						Virginia pine-------	60	6	
						Black oak-----------	60	3	
						Chestnut oak--------	60	3	
						Eastern white pine--	70	8	
						White oak-----------	60	3	
ShC------------- Shouns	4A	Slight	Slight	Slight	Severe	Northern red oak----	70	4	Yellow poplar, eastern white pine, black walnut, black locust, northern red oak, white oak.
						Eastern white pine--	80	10	
						White oak-----------	70	4	
						Virginia pine-------	70	8	
ShE------------- Shouns	4R	Moderate	Moderate	Moderate /slight	Severe	Northern red oak----	70	4	Yellow poplar, eastern white pine, black walnut, black locust, northern red oak, white oak.
						Eastern white pine--	80	10	
						White oak-----------	70	4	
						Virginia pine-------	70	8	
SnC------------- Shouns	4X	Slight	Moderate	Slight	Severe	Northern red oak----	70	4	Yellow poplar, eastern white pine, black walnut, black locust, northern red oak, white oak.
						Sugar maple---------	---	---	
						Black cherry--------	---	---	
						American basswood---	---	---	
SnE------------- Shouns	4R	Moderate	Moderate	Moderate /slight	Severe	Northern red oak----	70	4	Yellow poplar, eastern white pine, black walnut, black locust, northern red oak, white oak.
						Sugar maple---------	---	---	
						Black cherry--------	---	---	
						American basswood---	---	---	
SnF------------- Shouns	4R	Severe	Severe	Moderate /slight	Severe	Northern red oak----	70	4	Yellow poplar, eastern white pine, black walnut, black locust, northern red oak, white oak.
						Sugar maple---------	---	---	
						Black cherry--------	---	---	
						American basswood---	---	---	
SoC------------- Shouns	3X	Slight	Severe	Severe	Severe	Northern red oak----	65	3	Yellow poplar, eastern white pine, black walnut, black locust, northern red oak, white oak.
						Sugar maple---------	---	---	
						Black cherry--------	---	---	
						American basswood---	---	---	

See footnotes at end of table.

TABLE 8.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns				Potential productivity			Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Plant competition	Common trees	Site index	Productivity class*	
SoE Shouns	3R	Moderate	Severe	Severe	Severe	Northern red oak Sugar maple Black cherry American basswood	65 --- --- ---	3 --- --- ---	Yellow poplar, eastern white pine, black walnut, black locust, northern red oak, white oak.
SoF Shouns	3R	Severe	Severe	Severe	Severe	Northern red oak Sugar maple Black cherry American basswood	65 --- --- ---	3 --- --- ---	Yellow poplar, eastern white pine, black walnut, black locust, northern red oak, white oak.
SrB Simoda	7X	Slight	Moderate	Severe	Severe	Red spruce Red maple Black cherry Yellow birch	45 --- 60 ---	7 --- 3 ---	Norway spruce, red maple, red spruce, black cherry.
Tg Tioga	4A	Slight	Slight	Slight	Severe	Northern red oak Yellow poplar Sugar maple Black walnut	75 85 67 ---	4 6 3 ---	Eastern white pine, yellow poplar, Norway spruce, black walnut, black locust, northern red oak, white oak.
ToB Toms	4W	Slight	Moderate	Moderate	Severe	Northern red oak Pin oak Sugar maple	80 --- ---	4 --- ---	Yellow poplar, red maple, pin oak, Virginia pine, American sycamore.
TrC Trussel	9W	Slight	Severe	Severe	Severe	Red spruce Red maple Black cherry Yellow birch	55 --- 70 ---	9 --- 3 ---	Norway spruce, red maple, red spruce, black cherry.
TsC Trussel	7W	Slight	Severe	Severe	Severe	Red spruce Red maple Black cherry Yellow birch	45 --- 60 ---	7 --- 3 ---	Norway spruce, red maple, red spruce, black cherry.

See footnotes at end of table.

TABLE 8.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns				Potential productivity			Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Plant competition	Common trees	Site index	Productivity class*	
TyB------------- Tygart	4W	Slight	Severe	Severe	Severe	Northern red oak---- Red maple----------- Black oak-----------	80 --- 80	4 --- 4	Virginia pine, red maple, pin oak, American sycamore, yellow poplar.

* Productivity class is the yield in cubic meters per hectare per year calculated at the age of culmination of mean annual increment for fully stocked natural stands.

** See description of the map unit for composition and behavior characteristics of the map unit.

*** Equipment limitations in the extremely steep areas of these soils (slopes of 55 to 80 percent) are so severe that alternative methods of logging, such as cable logging, are needed. These areas are not suitable as sites for roads and skid trails.

TABLE 9.--RECREATIONAL DEVELOPMENT

(Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe." Absence of an entry indicates that the soil was not rated)

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
AgB Allegheny	Slight	Slight	Moderate: slope, small stones.	Slight	Slight.
AgC Allegheny	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight	Moderate: slope.
BcC*:					
Belmont	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight	Moderate: slope.
Cateache	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight	Moderate: slope, depth to rock.
BcD*:					
Belmont	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.	Severe: slope.
Cateache	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.	Severe: slope.
BeC*:					
Belmont	Moderate: slope, large stones.	Moderate: large stones, slope.	Severe: large stones, slope.	Slight	Moderate: slope, large stones.
Cateache	Moderate: large stones, slope.	Moderate: large stones, slope.	Severe: slope, large stones, small stones.	Slight	Moderate: slope, depth to rock, large stones.
BeE*, BeF*, BeG*:					
Belmont	Severe: slope.	Severe: slope.	Severe: large stones, slope.	Severe: slope.	Severe: slope.
Cateache	Severe: slope.	Severe: slope.	Severe: slope, large stones, small stones.	Severe: slope.	Severe: slope.
BkC Berks	Severe: small stones.	Severe: small stones.	Severe: slope, small stones.	Slight	Moderate: small stones, droughty, slope.
BkD Berks	Severe: slope, small stones.	Severe: small stones, slope.	Severe: slope, small stones.	Moderate: slope.	Severe: slope.
BkE, BkF Berks	Severe: slope, small stones.	Severe: small stones, slope.	Severe: slope, small stones.	Severe: slope.	Severe: slope.

See footnote at end of table.

TABLE 9.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
BmE, BmF, BmG Berks	Severe: slope, small stones.	Severe: slope, small stones.	Severe: small stones, slope, large stones.	Severe: slope.	Severe: slope, small stones.
BnC*:					
Berks	Severe: small stones.	Severe: small stones.	Severe: slope, small stones.	Slight	Moderate: small stones, droughty, slope.
Weikert	Severe: small stones, depth to rock.	Severe: small stones, depth to rock.	Severe: slope, small stones, depth to rock.	Slight	Severe: droughty, depth to rock.
BnD*, BnD3*:					
Berks	Severe: slope, small stones.	Severe: small stones, slope.	Severe: slope, small stones.	Moderate: slope.	Severe: slope.
Weikert	Severe: slope, small stones, depth to rock.	Severe: slope, small stones, depth to rock.	Severe: slope, small stones, depth to rock.	Moderate: slope.	Severe: droughty, depth to rock, slope.
BnF*, BnF3*, BnG*, BnG3*:					
Berks	Severe: slope, small stones.	Severe: small stones, slope.	Severe: slope, small stones.	Severe: slope.	Severe: slope.
Weikert	Severe: slope, small stones, depth to rock.	Severe: slope, small stones, depth to rock.	Severe: slope, small stones, depth to rock.	Severe: slope.	Severe: droughty, depth to rock, slope.
BrC Blackthorn	Moderate: slope, small stones.	Moderate: slope, small stones.	Severe: slope, small stones.	Slight	Moderate: large stones, slope.
BrD Blackthorn	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Moderate: slope.	Severe: slope.
BsC Blackthorn	Moderate: large stones, small stones, slope.	Moderate: slope, large stones, small stones.	Severe: large stones, slope, small stones.	Slight	Moderate: small stones, large stones, slope.
BsE, BsF Blackthorn	Severe: slope.	Severe: slope.	Severe: large stones, slope, small stones.	Severe: slope.	Severe: slope.
BtC*:					
Blackthorn	Moderate: large stones, small stones, slope.	Moderate: slope, large stones, small stones.	Severe: large stones, slope, small stones.	Slight	Moderate: small stones, large stones, slope.

See footnote at end of table.

TABLE 9.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
BtC*:					
Dekalb	Severe: small stones.	Severe: small stones.	Severe: slope, small stones, large stones.	Moderate: large stones.	Moderate: small stones, droughty, depth to rock.
Elliber	Severe: small stones.	Severe: small stones.	Severe: large stones, slope, small stones.	Slight	Severe: small stones.
BtE*:					
Blackthorn	Severe: slope.	Severe: slope.	Severe: large stones, slope, small stones.	Severe: slope.	Severe: slope.
Dekalb	Severe: slope, small stones.	Severe: slope, small stones.	Severe: slope, small stones, large stones.	Severe: slope.	Severe: slope.
Elliber	Severe: slope, small stones.	Severe: slope, small stones.	Severe: large stones, slope, small stones.	Severe: slope.	Severe: small stones, slope.
BuB Buchanan	Moderate: wetness, small stones, percs slowly.	Moderate: small stones, wetness, percs slowly.	Severe: small stones.	Moderate: wetness.	Moderate: small stones.
BuC Buchanan	Moderate: slope, small stones, wetness.	Moderate: slope, small stones, wetness.	Severe: slope, small stones.	Moderate: wetness.	Moderate: small stones, slope.
CaC Calvin	Moderate: slope, small stones.	Moderate: slope, small stones.	Severe: slope, small stones.	Slight	Moderate: large stones, slope, depth to rock.
CaD Calvin	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Moderate: slope.	Severe: slope.
CdC*:					
Calvin	Moderate: slope, large stones, small stones.	Moderate: slope, large stones, small stones.	Severe: large stones, slope, small stones.	Slight	Moderate: small stones, large stones, slope.
Dekalb	Severe: small stones.	Severe: small stones.	Severe: slope, small stones, large stones.	Moderate: large stones.	Moderate: small stones, droughty, depth to rock.
Hazleton	Moderate: slope, large stones.	Moderate: slope, large stones.	Severe: slope, small stones, large stones.	Moderate: large stones.	Moderate: slope, large stones.

See footnote at end of table.

TABLE 9.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
CdE*, CdF*, CdG*:					
Calvin	Severe: slope.	Severe: slope.	Severe: large stones, slope, small stones.	Severe: slope.	Severe: slope.
Dekalb	Severe: slope, small stones.	Severe: slope, small stones.	Severe: slope, small stones, large stones.	Severe: slope.	Severe: slope.
Hazleton	Severe: slope.	Severe: slope.	Severe: slope, small stones, large stones.	Severe: slope.	Severe: slope.
CeC Cateache	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight	Moderate: slope, depth to rock.
CfC Cateache	Moderate: large stones, slope.	Moderate: large stones, slope.	Severe: slope, large stones, small stones.	Slight	Moderate: slope, depth to rock, large stones.
CfE, CfF, CfG Cateache	Severe: slope.	Severe: slope.	Severe: slope, large stones, small stones.	Severe: slope.	Severe: slope.
Ch Chagrin	Severe: flooding.	Slight	Moderate: flooding.	Slight	Moderate: flooding.
CkB Clarksburg	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Moderate: small stones, wetness, slope.	Moderate: wetness.	Moderate: wetness.
CkC Clarksburg	Moderate: wetness, slope, percs slowly.	Moderate: wetness, slope, percs slowly.	Severe: slope.	Moderate: wetness.	Moderate: wetness, slope.
ClC Clarksburg	Moderate: wetness, large stones, slope.	Moderate: wetness, large stones, slope.	Severe: large stones, slope.	Moderate: wetness.	Moderate: wetness, large stones, slope.
ClD Clarksburg	Severe: slope.	Severe: slope.	Severe: large stones, slope.	Moderate: wetness, slope.	Severe: slope.
DeF*:					
Dekalb	Severe: slope, small stones.	Severe: slope, small stones.	Severe: slope, small stones, large stones.	Severe: slope.	Severe: slope.

See footnote at end of table.

TABLE 9.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
DeF*:					
Elliber	Severe: slope, small stones.	Severe: slope, small stones.	Severe: large stones, slope, small stones.	Severe: slope.	Severe: small stones, slope.
Blackthorn	Severe: slope.	Severe: slope.	Severe: large stones, slope, small stones.	Severe: slope.	Severe: slope.
DfG*:					
Dekalb	Severe: slope, small stones.	Severe: slope, small stones.	Severe: slope, small stones, large stones.	Severe: slope.	Severe: slope.
Elliber	Severe: slope, small stones.	Severe: slope, small stones.	Severe: large stones, slope, small stones.	Severe: slope.	Severe: small stones, slope.
Du Dunning	Severe: flooding, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
EdC Edom	Moderate: small stones, slope.	Moderate: small stones, slope.	Severe: slope.	Slight	Moderate: small stones, slope.
EdD Edom	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.	Severe: slope.
EdE, EdF Edom	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
ElC Elliber	Severe: small stones.	Severe: small stones.	Severe: slope, small stones.	Slight	Severe: small stones.
ElD Elliber	Severe: slope, small stones.	Severe: slope, small stones.	Severe: slope, small stones.	Moderate: slope.	Severe: small stones, slope.
ElE, ElF Elliber	Severe: slope, small stones.	Severe: slope, small stones.	Severe: slope, small stones.	Severe: slope.	Severe: small stones, slope.
ErB Ernest	Moderate: percs slowly, wetness.	Moderate: wetness, percs slowly.	Moderate: slope, small stones.	Moderate: wetness.	Moderate: wetness.
ErC Ernest	Moderate: slope, wetness, percs slowly.	Moderate: slope, wetness, percs slowly.	Severe: slope.	Severe: erodes easily.	Moderate: slope, wetness.
ErD Ernest	Severe: slope.	Severe: slope.	Severe: slope.	Severe: erodes easily.	Severe: slope.

See footnote at end of table.

TABLE 9.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
GaC------------------- Gauley	Severe: large stones.	Severe: large stones.	Severe: large stones, slope, small stones.	Severe: large stones.	Severe: small stones, large stones.
GaE, GaF, GaG--------- Gauley	Severe: slope, large stones.	Severe: slope, large stones.	Severe: large stones, slope, small stones.	Severe: large stones, slope.	Severe: small stones, large stones, slope.
HdC*:					
Hazleton-------------	Moderate: slope, large stones.	Moderate: slope, large stones.	Severe: slope, small stones, large stones.	Moderate: large stones.	Moderate: slope, large stones.
Dekalb---------------	Severe: small stones.	Severe: small stones.	Severe: slope, small stones, large stones.	Moderate: large stones.	Moderate: small stones, droughty, depth to rock.
HdE*, HdF*, HdG*:					
Hazleton-------------	Severe: slope.	Severe: slope.	Severe: slope, small stones, large stones.	Severe: slope.	Severe: slope.
Dekalb---------------	Severe: slope, small stones.	Severe: slope, small stones.	Severe: slope, small stones, large stones.	Severe: slope.	Severe: slope.
LaC------------------- Laidig	Moderate: slope, percs slowly, small stones.	Moderate: slope, percs slowly, small stones.	Severe: slope, small stones.	Slight----------	Moderate: small stones, droughty, slope.
LaD------------------- Laidig	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Moderate: slope.	Severe: slope.
LdE------------------- Laidig	Severe: slope.	Severe: slope.	Severe: slope, large stones, small stones.	Severe: slope.	Severe: slope.
LeF------------------- Laidig	Severe: slope, large stones.	Severe: slope, large stones.	Severe: slope, large stones, small stones.	Severe: slope.	Severe: slope.
LgC*:					
Laidig---------------	Moderate: slope, large stones, small stones.	Moderate: slope, small stones, large stones.	Severe: slope, large stones, small stones.	Slight----------	Moderate: slope, large stones, small stones.
Buchanan-------------	Moderate: slope, wetness, percs slowly.	Moderate: slope, wetness, percs slowly.	Severe: large stones, slope, small stones.	Moderate: wetness.	Moderate: small stones, slope, wetness.

See footnote at end of table.

TABLE 9.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
LhC*:					
Lehew	Moderate: slope, small stones.	Moderate: slope, small stones.	Severe: slope, small stones.	Moderate: large stones.	Moderate: small stones, droughty, depth to rock.
Dekalb	Moderate: slope, small stones.	Moderate: slope, small stones.	Severe: slope, small stones.	Moderate: large stones.	Severe: small stones, droughty, depth to rock.
LhD*:					
Lehew	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Moderate: large stones, slope.	Severe: slope.
Dekalb	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Moderate: slope, large stones.	Severe: slope.
LkC*:					
Lehew	Severe: small stones.	Severe: small stones.	Severe: slope, small stones, large stones.	Moderate: large stones.	Moderate: small stones, droughty, depth to rock.
Hazleton	Moderate: slope, large stones.	Moderate: slope, large stones.	Severe: slope, small stones, large stones.	Moderate: large stones.	Moderate: slope, large stones.
Dekalb	Severe: small stones.	Severe: small stones.	Severe: slope, small stones, large stones.	Moderate: large stones.	Moderate: small stones, droughty, depth to rock.
LkE*, LkF*, LkG*:					
Lehew	Severe: slope, small stones.	Severe: slope, small stones.	Severe: slope, small stones, large stones.	Severe: slope.	Severe: slope.
Hazleton	Severe: slope.	Severe: slope.	Severe: slope, small stones, large stones.	Severe: slope.	Severe: slope.
Dekalb	Severe: slope, small stones.	Severe: slope, small stones.	Severe: slope, small stones, large stones.	Severe: slope.	Severe: slope.
LmF*:					
Lithic Udorthents.					
Rock outcrop.					
Lo Lobdell	Severe: flooding.	Moderate: wetness.	Moderate: wetness, flooding.	Moderate: wetness.	Moderate: flooding.

See footnote at end of table.

TABLE 9.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
MaC------------------- Mandy	Moderate: slope, small stones.	Moderate: slope, small stones.	Severe: slope, small stones.	Slight----------	Moderate: small stones, slope, depth to rock.
MaD------------------- Mandy	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Moderate: slope.	Severe: slope.
MdE, MdF-------------- Mandy	Severe: slope.	Severe: slope.	Severe: large stones, slope, small stones.	Severe: slope.	Severe: slope.
Mn-------------------- Massanetta	Severe: flooding.	Slight----------	Moderate: flooding.	Slight----------	Moderate: flooding.
MoB------------------- Monongahela	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Moderate: slope, wetness, percs slowly.	Moderate: wetness.	Moderate: wetness.
MoC------------------- Monongahela	Moderate: wetness, slope.	Moderate: slope, wetness.	Severe: slope.	Severe: erodes easily.	Moderate: slope, wetness.
OeC------------------- Opequon	Severe: depth to rock.	Severe: depth to rock.	Severe: slope, depth to rock.	Severe: erodes easily.	Severe: depth to rock.
OeE, OeF, OeG--------- Opequon	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, erodes easily.	Severe: slope, depth to rock.
OnC3*:					
Opequon---------------	Severe: depth to rock.	Severe: depth to rock.	Severe: slope, depth to rock.	Severe: erodes easily.	Severe: depth to rock.
Caneyville------------	Moderate: percs slowly, slope.	Moderate: percs slowly, slope.	Severe: slope.	Severe: erodes easily.	Moderate: slope, depth to rock.
OnD3*:					
Opequon---------------	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: erodes easily.	Severe: slope, depth to rock.
Caneyville------------	Severe: slope.	Severe: slope.	Severe: slope.	Severe: erodes easily.	Severe: slope.
OnE3*, OnF3*:					
Opequon---------------	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, erodes easily.	Severe: slope, depth to rock.
Caneyville------------	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope, erodes easily.	Severe: slope.

See footnote at end of table.

TABLE 9.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
Or-------------------- Orrville	Severe: flooding, wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness, flooding.
Po-------------------- Potomac	Severe: flooding.	Slight----------	Moderate: small stones, flooding.	Slight----------	Moderate: flooding, droughty, large stones.
Pt-------------------- Potomac	Severe: flooding, large stones.	Severe: large stones.	Severe: large stones, small stones.	Moderate: large stones.	Severe: large stones.
Pu-------------------- Purdy	Severe: wetness, percs slowly.	Severe: wetness, percs slowly.	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness.
Qu*. Quarry					
Ro*: Rock outcrop.					
Rubble land.					
RuF------------------- Rushtown	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Severe: slope.	Severe: slope.
ShC------------------- Shouns	Moderate: slope, large stones.	Moderate: slope, large stones.	Severe: large stones, slope.	Slight----------	Moderate: large stones, slope.
ShE------------------- Shouns	Severe: slope.	Severe: slope.	Severe: large stones, slope.	Severe: slope.	Severe: slope.
SnC------------------- Shouns	Severe: large stones.	Severe: large stones.	Severe: large stones, slope.	Moderate: large stones.	Moderate: large stones, slope.
SnE, SnF-------------- Shouns	Severe: slope, large stones.	Severe: slope, large stones.	Severe: large stones, slope.	Severe: slope.	Severe: slope.
SoC------------------- Shouns	Severe: large stones.	Severe: large stones.	Severe: slope, large stones.	Severe: large stones.	Severe: large stones.
SoE, SoF-------------- Shouns	Severe: slope, large stones.	Severe: slope, large stones.	Severe: slope, large stones.	Severe: slope, large stones.	Severe: slope, large stones.
SrB------------------- Simoda	Severe: large stones.	Severe: large stones.	Severe: large stones, slope, small stones.	Moderate: wetness, large stones.	Severe: large stones.
Tg-------------------- Tioga	Severe: flooding.	Slight----------	Moderate: flooding.	Slight----------	Moderate: flooding.

See footnote at end of table.

TABLE 9.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
ToB------------------- Toms	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
TrC------------------- Trussel	Severe: wetness.	Severe: wetness.	Severe: slope, wetness.	Severe: wetness.	Severe: wetness.
TsC------------------- Trussel	Severe: wetness, large stones.	Severe: wetness, large stones.	Severe: wetness, large stones, slope.	Severe: wetness.	Severe: large stones, wetness.
TyB------------------- Tygart	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
Ud. Udorthents					

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 10.--WILDLIFE HABITAT

(See text for definitions of "good," "fair," "poor," and "very poor." Absence of an entry indicates that the soil was not rated)

Soil name and map symbol	Potential for habitat elements							Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
AgB---------------- Allegheny	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
AgC---------------- Allegheny	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
BcC*:										
Belmont-----------	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
Cateache----------	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
BcD*:										
Belmont-----------	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
Cateache----------	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
BeC*:										
Belmont-----------	Very poor.	Poor	Good	Good	Good	Very poor.	Very poor.	Poor	Good	Very poor.
Cateache----------	Very poor.	Poor	Good	Good	Good	Very poor.	Very poor.	Poor	Good	Very poor.
BeE*:										
Belmont-----------	Very poor.	Poor	Good	Good	Good	Very poor.	Very poor.	Poor	Good	Very poor.
Cateache----------	Very poor.	Poor	Good	Good	Good	Very poor.	Very poor.	Poor	Good	Very poor.
BeF*, BeG*:										
Belmont-----------	Very poor.	Poor	Good	Good	Good	Very poor.	Very poor.	Poor	Good	Very poor.
Cateache----------	Very poor.	Poor	Good	Good	Good	Very poor.	Very poor.	Poor	Good	Very poor.
BkC---------------- Berks	Poor	Fair	Fair	Poor	Poor	Very poor.	Very poor.	Fair	Poor	Very poor.
BkD---------------- Berks	Poor	Fair	Fair	Poor	Poor	Very poor.	Very poor.	Fair	Poor	Very poor.
BkE---------------- Berks	Very poor.	Fair	Fair	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
BkF, BmE, BmF, BmG- Berks	Very poor.	Poor	Fair	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
BnC*:										
Berks-------------	Poor	Fair	Fair	Poor	Poor	Very poor.	Very poor.	Fair	Poor	Very poor.

See footnote at end of table.

TABLE 10.--WILDLIFE HABITAT--Continued

Soil name and map symbol	Potential for habitat elements							Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
BnC*:										
Weikert-----------	Very poor.	Poor	Poor	Very poor.	Very poor.	Very poor.	Very poor.	Poor	Very poor.	Very poor.
BnD*, BnD3*:										
Berks-------------	Poor	Fair	Fair	Poor	Poor	Very poor.	Very poor.	Fair	Poor	Very poor.
Weikert-----------	Very poor.	Poor	Poor	Very poor.	Very poor.	Very poor.	Very poor.	Poor	Very poor.	Very poor.
BnF*, BnF3*, BnG*, BnG3*:										
Berks------------	Very poor.	Poor	Fair	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
Weikert----------	Very poor.	Poor	Poor	Very poor.	Very poor.	Very poor.	Very poor.	Poor	Very poor.	Very poor.
BrC---------------- Blackthorn	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
BrD---------------- Blackthorn	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
BsC---------------- Blackthorn	Very poor.	Poor	Good	Good	Good	Very poor.	Very poor.	Poor	Good	Very poor.
BsE---------------- Blackthorn	Very poor.	Poor	Good	Good	Good	Very poor.	Very poor.	Poor	Good	Very poor.
BsF---------------- Blackthorn	Very poor.	Poor	Good	Good	Good	Very poor.	Very poor.	Poor	Good	Very poor.
BtC*:										
Blackthorn--------	Very poor.	Poor	Good	Good	Good	Very poor.	Very poor.	Poor	Good	Very poor.
Dekalb------------	Very poor.	Poor	Good	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
Elliber-----------	Very poor.	Poor	Good	Good	Good	Very poor.	Very poor.	Poor	Good	Very poor.
BtE*:										
Blackthorn--------	Very poor.	Poor	Good	Good	Good	Very poor.	Very poor.	Poor	Good	Very poor.
Dekalb------------	Very poor.	Poor	Good	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
Elliber-----------	Very poor.	Poor	Good	Good	Good	Very poor.	Very poor.	Poor	Good	Very poor.
BuB---------------- Buchanan	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
BuC---------------- Buchanan	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.

See footnote at end of table.

TABLE 10.--WILDLIFE HABITAT--Continued

Soil name and map symbol	Potential for habitat elements							Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
CaC----------------- Calvin	Fair	Good	Good	Fair	Fair	Very poor.	Very poor.	Good	Fair	Very poor.
CaD----------------- Calvin	Poor	Fair	Good	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
CdC*:										
Calvin-------------	Very poor.	Poor	Good	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
Dekalb-------------	Very poor.	Poor	Good	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
Hazleton-----------	Very poor.	Poor	Good	Good	Good	Very poor.	Very poor.	Poor	Good	Very poor.
CdE*:										
Calvin-------------	Very poor.	Poor	Good	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
Dekalb-------------	Very poor.	Poor	Good	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
Hazleton-----------	Very poor.	Poor	Good	Good	Good	Very poor.	Very poor.	Poor	Good	Very poor.
CdF*, CdG*:										
Calvin-------------	Very poor.	Poor	Good	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
Dekalb-------------	Very poor.	Poor	Good	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
Hazleton-----------	Very poor.	Poor	Good	Good	Good	Very poor.	Very poor.	Poor	Good	Very poor.
CeC----------------- Cateache	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
CfC----------------- Cateache	Very poor.	Poor	Good	Good	Good	Very poor.	Very poor.	Poor	Good	Very poor.
CfE, CfF, CfG------- Cateache	Very poor.	Poor	Good	Good	Good	Very poor.	Very poor.	Poor	Good	Very poor.
Ch------------------ Chagrin	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
CkB----------------- Clarksburg	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
CkC----------------- Clarksburg	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
ClC, ClD------------ Clarksburg	Very poor.	Poor	Good	Good	Good	Very poor.	Very poor.	Poor	Good	Very poor.
DeF*:										
Dekalb-------------	Very poor.	Poor	Good	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.

See footnote at end of table.

TABLE 10.--WILDLIFE HABITAT--Continued

Soil name and map symbol	Potential for habitat elements							Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
DeF*:										
Elliber-----------	Very poor.	Poor	Good	Good	Good	Very poor.	Very poor.	Poor	Good	Very poor.
Blackthorn--------	Very poor.	Poor	Good	Good	Good	Very poor.	Very poor.	Poor	Good	Very poor.
DfG*:										
Dekalb------------	Very poor.	Poor	Good	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
Elliber-----------	Very poor.	Poor	Good	Good	Good	Very poor.	Very poor.	Poor	Good	Very poor.
Du----------------- Dunning	Very poor.	Poor	Poor	Poor	Poor	Good	Good	Poor	Poor	Good.
EdC---------------- Edom	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
EdD---------------- Edom	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
EdE---------------- Edom	Very poor.	Fair	Good	Good	Good	Very poor.	Very poor.	Poor	Good	Very poor.
EdF---------------- Edom	Very poor.	Poor	Good	Good	Good	Very poor.	Very poor.	Poor	Fair	Very poor.
ElC---------------- Elliber	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
ElD---------------- Elliber	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
ElE---------------- Elliber	Very poor.	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
ElF---------------- Elliber	Very poor.	Poor	Good	Good	Good	Very poor.	Very poor.	Poor	Good	Very poor.
ErB---------------- Ernest	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
ErC---------------- Ernest	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
ErD---------------- Ernest	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
GaC, GaE, GaF, GaG- Gauley	Very poor.	Very poor.	Very poor.	Very poor.	Poor	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.
HdC*:										
Hazleton----------	Very poor.	Poor	Good	Good	Good	Very poor.	Very poor.	Poor	Good	Very poor.
Dekalb------------	Very poor.	Poor	Good	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.

See footnote at end of table.

TABLE 10.--WILDLIFE HABITAT--Continued

Soil name and map symbol	Potential for habitat elements							Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
HdE*, HdF*, HdG*:										
Hazleton	Very poor.	Poor	Good	Good	Good	Very poor.	Very poor.	Poor	Good	Very poor.
Dekalb	Very poor.	Poor	Good	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
LaC Laidig	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
LaD Laidig	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
LdE Laidig	Very poor.	Poor	Good	Good	Good	Very poor.	Very poor.	Poor	Good	Very poor.
LeF Laidig	Very poor.	Very poor.	Good	Good	Good	Very poor.	Very poor.	Poor	Good	Very poor.
LgC*:										
Laidig	Very poor.	Poor	Good	Good	Good	Very poor.	Very poor.	Poor	Good	Very poor.
Buchanan	Very poor.	Poor	Good	Good	Good	Poor	Very poor.	Poor	Good	Very poor.
LhC*:										
Lehew	Fair	Fair	Good	Fair	Fair	Very poor.	Very poor.	Good	Fair	Very poor.
Dekalb	Fair	Fair	Good	Fair	Fair	Very poor.	Very poor.	Good	Fair	Very poor.
LhD*:										
Lehew	Poor	Fair	Good	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
Dekalb	Poor	Fair	Good	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
LkC*:										
Lehew	Very poor.	Poor	Good	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
Hazleton	Very poor.	Poor	Good	Good	Good	Very poor.	Very poor.	Poor	Good	Very poor.
Dekalb	Very poor.	Poor	Good	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
LkE*, LkF*, LkG*:										
Lehew	Very poor.	Poor	Good	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
Hazleton	Very poor.	Poor	Good	Good	Good	Very poor.	Very poor.	Poor	Good	Very poor.
Dekalb	Very poor.	Poor	Good	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.

See footnote at end of table.

TABLE 10.--WILDLIFE HABITAT--Continued

Soil name and map symbol	Potential for habitat elements							Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
LmF*:										
Lithic Udorthents.										
Rock outcrop.										
Lo------------------ Lobdell	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
MaC----------------- Mandy	Poor	Fair	Fair	Poor	Poor	Very poor.	Very poor.	Fair	Poor	Very poor.
MaD----------------- Mandy	Poor	Fair	Fair	Poor	Poor	Very poor.	Very poor.	Fair	Poor	Very poor.
MdE, MdF------------ Mandy	Very poor.	Poor	Fair	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
Mn------------------ Massanetta	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
MoB----------------- Monongahela	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
MoC----------------- Monongahela	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
OeC----------------- Opequon	Poor	Poor	Fair	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
OeE, OeF, OeG------- Opequon	Very poor.	Poor	Fair	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
OnC3*:										
Opequon------------	Poor	Poor	Fair	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
Caneyville---------	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
OnD3*:										
Opequon------------	Poor	Poor	Fair	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
Caneyville---------	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
OnE3*:										
Opequon------------	Very poor.	Poor	Fair	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
Caneyville---------	Very poor.	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
OnF3*:										
Opequon------------	Very poor.	Poor	Fair	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
Caneyville---------	Very poor.	Poor	Good	Good	Good	Very poor.	Very poor.	Poor	Good	Very poor.

See footnote at end of table.

TABLE 10.--WILDLIFE HABITAT--Continued

Soil name and map symbol	Potential for habitat elements							Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
Or----------------- Orrville	Fair	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
Po, Pt------------- Potomac	Poor	Poor	Fair	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
Pu----------------- Purdy	Poor	Fair	Fair	Fair	Fair	Good	Good	Fair	Fair	Good.
Qu*. Quarry										
Ro*: Rock outcrop.										
Rubble land.										
RuF---------------- Rushtown	Very poor.	Poor	Fair	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
ShC, ShE----------- Shouns	Very poor.	Poor	Good	Good	Good	Very poor.	Very poor.	Poor	Good	Very poor.
SnC, SnE, SnF------ Shouns	Very poor.	Very poor.	Good	Good	Good	Very poor.	Very poor.	Poor	Good	Very poor.
SoC, SoE, SoF------ Shouns	Very poor.	Very poor.	Very poor.	Fair	Fair	Very poor.	Very poor.	Very poor.	Poor	Very poor.
SrB---------------- Simoda	Very poor.	Very poor.	Good	Good	Good	Very poor.	Very poor.	Poor	Fair	Very poor.
Tg----------------- Tioga	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
ToB---------------- Toms	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
TrC---------------- Trussel	Poor	Fair	Fair	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
TsC---------------- Trussel	Very poor.	Very poor.	Fair	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
TyB---------------- Tygart	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
Ud. Udorthents										

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 11.--BUILDING SITE DEVELOPMENT

(Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe." Absence of an entry indicates that the soil was not rated. The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation)

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
AgB Allegheny	Slight	Slight	Slight	Moderate: slope.	Slight	Slight.
AgC Allegheny	Moderate: slope.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope.	Moderate: slope.
BcC*:						
Belmont	Moderate: slope, depth to rock.	Moderate: shrink-swell, slope.	Moderate: slope, depth to rock, shrink-swell.	Severe: slope.	Severe: low strength.	Moderate: slope.
Cateache	Moderate: slope, depth to rock.	Moderate: slope, shrink-swell.	Moderate: slope, depth to rock, shrink-swell.	Severe: slope.	Moderate: slope, shrink-swell, frost action.	Moderate: slope, depth to rock.
BcD*:						
Belmont	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope, low strength.	Severe: slope.
Cateache	Severe: slope, slippage.	Severe: slope, slippage.	Severe: slope, slippage.	Severe: slope, slippage.	Severe: slope, slippage.	Severe: slope.
BeC*:						
Belmont	Moderate: depth to rock, slope.	Moderate: shrink-swell, slope.	Moderate: slope, depth to rock, shrink-swell.	Severe: slope.	Severe: low strength.	Moderate: slope, large stones.
Cateache	Moderate: slope, depth to rock.	Moderate: slope, shrink-swell.	Moderate: slope, depth to rock, shrink-swell.	Severe: slope, slippage.	Moderate: slope, shrink-swell, frost action.	Moderate: slope, depth to rock, large stones.
BeE*, BeF*, BeG*:						
Belmont	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope, low strength.	Severe: slope.
Cateache	Severe: slope, slippage.	Severe: slope, slippage.	Severe: slope, slippage.	Severe: slope, slippage.	Severe: slope, slippage.	Severe: slope.
BkC Berks	Moderate: slope, depth to rock.	Moderate: slope.	Moderate: slope, depth to rock.	Severe: slope.	Moderate: slope.	Moderate: small stones, droughty, slope.
BkD, BkE, BkF Berks	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.

See footnote at end of table.

TABLE 11.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
BmE, BmF, BmG----- Berks	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope, small stones.
BnC*:						
Berks------------	Moderate: slope, depth to rock.	Moderate: slope.	Moderate: slope, depth to rock.	Severe: slope.	Moderate: slope.	Moderate: small stones, droughty, slope.
Weikert----------	Severe: depth to rock.	Moderate: slope, depth to rock.	Severe: depth to rock.	Severe: slope.	Moderate: depth to rock, slope.	Severe: droughty, depth to rock.
BnD*, BnF*, BnG*:						
Berks------------	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Weikert----------	Severe: depth to rock, slope.	Severe: slope.	Severe: depth to rock, slope.	Severe: slope.	Severe: slope.	Severe: droughty, depth to rock, slope.
BnD3*, BnF3*, BnG3*:						
Berks-----------	Severe: slope, slippage.	Severe: slope, slippage.	Severe: slope, slippage.	Severe: slope, slippage.	Severe: slope, slippage.	Severe slope.
Weikert---------	Severe: depth to rock, slope, slippage.	Severe: slope, slippage.	Severe: depth to rock, slope, slippage.	Severe: slope, slippage.	Severe: slope, slippage.	Severe: droughty, depth to rock, slope.
BrC--------------- Blackthorn	Moderate: slope.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope.	Moderate: large stones, slope.
BrD--------------- Blackthorn	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
BsC--------------- Blackthorn	Moderate: slope.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope.	Moderate: small stones, large stones, slope.
BsE, BsF---------- Blackthorn	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
BtC*:						
Blackthorn-------	Moderate: slope.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope.	Moderate: small stones, large stones, slope.
Dekalb-----------	Severe: depth to rock.	Moderate: slope, depth to rock, large stones.	Severe: depth to rock.	Severe: slope.	Moderate: slope, depth to rock, large stones.	Moderate: small stones, droughty, depth to rock.

See footnote at end of table.

TABLE 11.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
BtC*:						
Elliber----------	Moderate: large stones, slope.	Moderate: slope, large stones.	Moderate: slope, large stones.	Severe: slope.	Moderate: slope, large stones.	Severe: small stones.
BtE*:						
Blackthorn-------	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Dekalb-----------	Severe: slope, depth to rock.	Severe: slope.	Severe: slope, depth to rock.	Severe: slope.	Severe: slope.	Severe: slope.
Elliber----------	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: small stones, slope.
BuB--------------- Buchanan	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: slope, wetness.	Moderate: wetness, frost action.	Moderate: small stones.
BuC--------------- Buchanan	Severe: wetness.	Moderate: slope, wetness.	Severe: wetness.	Severe: slope.	Moderate: slope, wetness, frost action.	Moderate: small stones, slope.
CaC--------------- Calvin	Moderate: slope, depth to rock.	Moderate: slope.	Moderate: slope, depth to rock.	Severe: slope.	Moderate: slope.	Moderate: large stones, slope, depth to rock.
CaD--------------- Calvin	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
CdC*:						
Calvin-----------	Moderate: depth to rock, slope.	Moderate: slope.	Moderate: depth to rock, slope.	Severe: slope.	Moderate: slope.	Moderate: small stones, large stones, slope.
Dekalb-----------	Severe: depth to rock.	Moderate: slope, depth to rock, large stones.	Severe: depth to rock.	Severe: slope.	Moderate: slope, depth to rock, large stones.	Moderate: small stones, droughty, depth to rock.
Hazleton---------	Moderate: depth to rock, slope, large stones.	Moderate: slope, large stones.	Moderate: slope, large stones, depth to rock.	Severe: slope.	Moderate: slope, large stones.	Moderate: slope, large stones.
CdE*, CdF*, CdG*:						
Calvin-----------	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Dekalb-----------	Severe: slope, depth to rock.	Severe: slope.	Severe: slope, depth to rock.	Severe: slope.	Severe: slope.	Severe: slope.
Hazleton---------	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.

See footnote at end of table.

TABLE 11.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
CeC Cateache	Moderate: slope, depth to rock.	Moderate: slope, shrink-swell.	Moderate: slope, depth to rock, shrink-swell.	Severe: slope.	Moderate: slope, shrink-swell, frost action.	Moderate: slope, depth to rock.
CfC Cateache	Moderate: slope, depth to rock.	Moderate: slope, shrink-swell.	Moderate: slope, depth to rock, shrink-swell.	Severe: slope.	Moderate: slope, shrink-swell, frost action.	Moderate: slope, depth to rock, large stones.
CfE, CfF, CfG Cateache	Severe: slope, slippage.	Severe: slope, slippage.	Severe: slope, slippage.	Severe: slope, slippage.	Severe: slope, slippage.	Severe: slope.
Ch Chagrin	Moderate: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Moderate: flooding.
CkB Clarksburg	Severe: wetness.	Moderate: wetness, shrink-swell.	Severe: wetness.	Moderate: wetness, shrink-swell, slope.	Moderate: low strength, wetness.	Moderate: wetness.
CkC Clarksburg	Severe: wetness.	Moderate: wetness, shrink-swell, slope.	Severe: wetness.	Severe: slope.	Moderate: low strength, wetness, slope.	Moderate: wetness, slope.
ClC Clarksburg	Severe: wetness.	Moderate: wetness, shrink-swell, slope.	Severe: wetness.	Severe: slope.	Moderate: low strength, wetness, slope.	Moderate: wetness, large stones, slope.
ClD Clarksburg	Severe: wetness, slope.	Severe: slope.	Severe: wetness, slope.	Severe: slope.	Severe: slope.	Severe: slope.
DeF*:						
Dekalb	Severe: slope, depth to rock.	Severe: slope.	Severe: slope, depth to rock.	Severe: slope.	Severe: slope.	Severe: slope.
Elliber	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: small stones, slope.
Blackthorn	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
DfG*:						
Dekalb	Severe: slope, depth to rock.	Severe: slope.	Severe: slope, depth to rock.	Severe: slope.	Severe: slope.	Severe: slope.
Elliber	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: small stones, slope.
Du Dunning	Severe: wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: low strength, wetness, flooding.	Severe: wetness.

See footnote at end of table.

TABLE 11.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
EdC Edom	Moderate: too clayey, slope.	Moderate: shrink-swell, slope.	Moderate: slope, shrink-swell.	Severe: slope.	Severe: low strength.	Moderate: small stones, slope.
EdD, EdE, EdF Edom	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: low strength, slope.	Severe: slope.
ElC Elliber	Moderate: large stones, slope.	Moderate: slope, large stones.	Moderate: slope, large stones.	Severe: slope.	Moderate: slope, large stones.	Severe: small stones.
ElD, ElE, ElF Elliber	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: small stones, slope.
ErB Ernest	Severe: wetness.	Moderate: wetness, shrink-swell.	Severe: wetness.	Moderate: wetness, shrink-swell, slope.	Severe: low strength.	Moderate: wetness.
ErC Ernest	Severe: wetness.	Moderate: wetness, shrink-swell, slope.	Severe: wetness.	Severe: slope.	Severe: low strength.	Moderate: wetness, slope.
ErD Ernest	Severe: wetness, slope.	Severe: slope.	Severe: wetness, slope.	Severe: slope.	Severe: low strength, slope.	Severe: slope.
GaC Gauley	Severe: depth to rock, large stones.	Severe: large stones.	Severe: depth to rock, large stones.	Severe: slope, large stones.	Severe: large stones.	Severe: small stones, large stones.
GaE, GaF, GaG Gauley	Severe: depth to rock, large stones, slope.	Severe: large stones, slope.	Severe: depth to rock, slope, large stones.	Severe: slope, large stones.	Severe: slope, large stones.	Severe: small stones, large stones, slope.
HdC*:						
Hazleton	Moderate: depth to rock, slope, large stones.	Moderate: slope, large stones.	Moderate: slope, large stones, depth to rock.	Severe: slope.	Moderate: slope, large stones.	Moderate: slope, large stones.
Dekalb	Severe: depth to rock.	Moderate: slope, depth to rock, large stones.	Severe: depth to rock.	Severe: slope.	Moderate: slope, depth to rock, large stones.	Moderate: small stones, droughty, depth to rock.
HdE*, HdF*, HdG*:						
Hazleton	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Dekalb	Severe: slope, depth to rock.	Severe: slope.	Severe: slope, depth to rock.	Severe: slope.	Severe: slope.	Severe: slope.

See footnote at end of table.

TABLE 11.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
LaC---------------- Laidig	Moderate: wetness, slope.	Moderate: slope.	Moderate: slope, wetness.	Severe: slope.	Moderate: slope, frost action.	Moderate: small stones, droughty, slope.
LaD, LdE, LeF------ Laidig	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
LgC*:						
Laidig------------	Moderate: slope, wetness.	Moderate: slope.	Moderate: slope, wetness.	Severe: slope.	Moderate: slope, frost action.	Moderate: slope, large stones, small stones.
Buchanan----------	Severe: wetness.	Moderate: wetness, slope.	Severe: wetness.	Severe: slope.	Moderate: wetness, slope, frost action.	Moderate: small stones, slope, wetness.
LhC*:						
Lehew-------------	Severe: depth to rock.	Moderate: slope, depth to rock, large stones.	Severe: depth to rock.	Severe: slope.	Moderate: slope, depth to rock, large stones.	Moderate: small stones, droughty, depth to rock.
Dekalb------------	Severe: depth to rock.	Moderate: slope, depth to rock, large stones.	Severe: depth to rock.	Severe: slope.	Moderate: slope, depth to rock, large stones.	Moderate: small stones, droughty, depth to rock.
LhD*:						
Lehew-------------	Severe: slope, depth to rock.	Severe: slope.	Severe: slope, depth to rock.	Severe: slope.	Severe: slope.	Severe: slope.
Dekalb------------	Severe: slope, depth to rock.	Severe: slope.	Severe: slope, depth to rock.	Severe: slope.	Severe: slope.	Severe: slope.
LkC*:						
Lehew-------------	Severe: depth to rock.	Moderate: slope, depth to rock, large stones.	Severe: depth to rock.	Severe: slope.	Moderate: slope, depth to rock, large stones.	Moderate: small stones, droughty, depth to rock.
Hazleton----------	Moderate: depth to rock, slope, large stones.	Moderate: slope, large stones.	Moderate: slope, large stones, depth to rock.	Severe: slope.	Moderate: slope, large stones.	Moderate: slope, large stones.
Dekalb------------	Severe: depth to rock.	Moderate: slope, depth to rock, large stones.	Severe: depth to rock.	Severe: slope.	Moderate: slope, depth to rock, large stones.	Moderate: small stones, droughty, depth to rock.
LkE*, LkF*, LkG*:						
Lehew-------------	Severe: slope, depth to rock.	Severe: slope.	Severe: depth to rock, slope.	Severe: slope.	Severe: slope.	Severe: slope.

See footnote at end of table.

TABLE 11.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
LkE*, LkF*, LkG*:						
Hazleton	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Dekalb	Severe: slope, depth to rock.	Severe: slope.	Severe: slope, depth to rock.	Severe: slope.	Severe: slope.	Severe: slope.
LmF*:						
Lithic Udorthents.						
Rock outcrop.						
Lo Lobdell	Severe: wetness.	Severe: flooding.	Severe: flooding, wetness.	Severe: flooding.	Severe: flooding, frost action.	Moderate: flooding.
MaC Mandy	Moderate: depth to rock, slope.	Moderate: slope.	Moderate: depth to rock, slope.	Severe: slope.	Moderate: slope.	Moderate: small stones, slope, depth to rock.
MaD, MdE, MdF Mandy	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Mn Massanetta	Moderate: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Moderate: flooding.
MoB Monongahela	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness, slope.	Moderate: low strength, wetness.	Moderate: wetness.
MoC Monongahela	Severe: wetness.	Moderate: wetness, slope.	Severe: wetness.	Severe: slope.	Moderate: slope, low strength, wetness.	Moderate: slope, wetness.
OeC Opequon	Severe: depth to rock.	Severe: depth to rock, shrink-swell.	Severe: depth to rock, shrink-swell.	Severe: slope, depth to rock, shrink-swell.	Severe: depth to rock, low strength, shrink-swell.	Severe: depth to rock.
OeE, OeF, OeG Opequon	Severe: slope, depth to rock.	Severe: slope, depth to rock, shrink-swell.	Severe: slope, depth to rock, shrink-swell.	Severe: slope, depth to rock, shrink-swell.	Severe: slope, depth to rock, low strength.	Severe: slope, depth to rock.
OnC3*:						
Opequon	Severe: depth to rock.	Severe: depth to rock, shrink-swell.	Severe: depth to rock, shrink-swell.	Severe: slope, depth to rock, shrink-swell.	Severe: depth to rock, low strength, shrink-swell.	Severe: depth to rock.
Caneyville	Severe: depth to rock.	Moderate: shrink-swell, slope, depth to rock.	Severe: depth to rock.	Severe: slope.	Severe: low strength.	Moderate: slope, depth to rock.

See footnote at end of table.

TABLE 11.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
OnD3*, OnE3*, OnF3*:						
Opequon---------	Severe: slope, depth to rock, slippage.	Severe: slope, depth to rock, slippage.	Severe: slope, depth to rock, slippage.	Severe: slope, depth to rock, slippage.	Severe: slope, depth to rock, slippage.	Severe: slope, depth to rock.
Caneyville------	Severe: depth to rock, slope, slippage.	Severe: slope, slippage.	Severe: depth to rock, slope, slippage.	Severe: slope, slippage.	Severe: low strength, slope, slippage.	Severe: slope.
Or---------------- Orrville	Severe: wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, frost action.	Moderate: wetness, flooding.
Po---------------- Potomac	Severe: cutbanks cave.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Moderate: large stones, droughty, flooding.
Pt---------------- Potomac	Severe: cutbanks cave.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: large stones.
Pu---------------- Purdy	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness, low strength, frost action.	Severe: wetness.
Qu*. Quarry						
Ro*: Rock outcrop.						
Rubble land.						
RuF--------------- Rushtown	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
ShC--------------- Shouns	Moderate: slope.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: low strength, slope, frost action.	Moderate: large stones, slope.
ShE--------------- Shouns	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
SnC--------------- Shouns	Moderate: slope.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: low strength, slope, frost action.	Moderate: large stones, slope.
SnE, SnF---------- Shouns	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
SoC--------------- Shouns	Severe: large stones.	Severe: large stones.	Severe: large stones.	Severe: slope, large stones.	Severe: large stones.	Severe: large stones.

See footnote at end of table.

TABLE 11.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
SoE, SoF---------- Shouns	Severe: slope, large stones.	Severe: slope, large stones.	Severe: slope, large stones.	Severe: slope, large stones.	Severe: slope, large stones.	Severe: slope, large stones.
SrB--------------- Simoda	Severe: wetness.	Moderate: wetness, shrink-swell, slope.	Severe: wetness.	Severe: slope.	Moderate: wetness, slope, frost action.	Severe: large stones.
Tg---------------- Tioga	Severe: cutbanks cave.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Moderate: flooding.
ToB--------------- Toms	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: low strength, wetness, frost action.	Severe: wetness.
TrC--------------- Trussel	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness, slope.	Severe: wetness, frost action.	Severe: wetness.
TsC--------------- Trussel	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness, slope.	Severe: wetness, frost action.	Severe: large stones, wetness.
TyB--------------- Tygart	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: low strength, wetness.	Severe: wetness.
Ud. Udorthents						

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 12.--SANITARY FACILITIES

(Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "good," and other terms. Absence of an entry indicates that the soil was not rated. The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation)

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill	Application of agricultural waste
AgB Allegheny	Slight	Moderate: seepage, slope.	Slight	Slight	Good	Slight.
AgC Allegheny	Moderate: slope.	Severe: slope.	Moderate: slope.	Moderate: slope.	Fair: slope.	Moderate: slope.
BcC*:						
Belmont**	Moderate: depth to rock, slope.	Severe: slope.	Severe: depth to rock.	Moderate: depth to rock, slope.	Fair: slope, too clayey, depth to rock.	Moderate: slope.
Cateache**	Severe: depth to rock.	Severe: slope, depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Poor: depth to rock, thin layer.	Moderate: slope.
BcD*:						
Belmont**	Severe: slope.	Severe: slope.	Severe: slope, depth to rock.	Severe: slope.	Poor: slope.	Severe: slope.
Cateache**	Severe: slope, depth to rock, slippage.	Severe: slope, depth to rock, slippage.	Severe: slope, depth to rock, slippage.	Severe: slope, depth to rock, slippage.	Poor: slope, depth to rock, thin layer.	Severe: slope.
BeC*:						
Belmont**	Moderate: depth to rock, slope.	Severe: slope.	Severe: depth to rock.	Moderate: depth to rock, slope.	Fair: slope, too clayey, depth to rock.	Moderate: slope.
Cateache**	Severe: depth to rock.	Severe: slope, depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Poor: depth to rock, thin layer.	Moderate: slope.
BeE*, BeF*, BeG*:						
Belmont**	Severe: slope.	Severe: slope.	Severe: slope, depth to rock.	Severe: slope.	Poor: slope.	Severe: slope.

See footnotes at end of table.

TABLE 12.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill	Application of agricultural waste
BeE*, BeF*, BeG*:						
Cateache**	Severe: slope, depth to rock, slippage.	Severe: slope, depth to rock, slippage.	Severe: slope, depth to rock, slippage.	Severe: slope, depth to rock, slippage.	Poor: slope, depth to rock, thin layer.	Severe: slope.
BkC Berks	Severe: depth to rock.	Severe: slope, seepage, depth to rock.	Severe: depth to rock, seepage.	Severe: seepage, depth to rock.	Poor: small stones, depth to rock, thin layer.	Moderate: slope, large stones.
BkD, BkE, BkF Berks	Severe: slope, depth to rock.	Severe: slope, seepage, depth to rock.	Severe: slope, depth to rock, seepage.	Severe: slope, seepage, depth to rock.	Poor: slope, small stones, depth to rock.	Severe: slope.
BmE, BmF, BmG Berks	Severe: depth to rock, slope.	Severe: slope, depth to rock, seepage.	Severe: slope, depth to rock, seepage.	Severe: seepage, slope, depth to rock.	Poor: small stones, slope, depth to rock.	Severe: slope.
BnC*:						
Berks	Severe: depth to rock.	Severe: slope, seepage, depth to rock.	Severe: depth to rock, seepage.	Severe: seepage, depth to rock.	Poor: small stones, depth to rock, thin layer.	Moderate: slope, large stones.
Weikert	Severe: depth to rock.	Severe: seepage, depth to rock, slope.	Severe: depth to rock, seepage.	Severe: depth to rock, seepage.	Poor: depth to rock, seepage, small stones.	Moderate: slope, depth to rock.
BnD*, BnF*, BnG*:						
Berks	Severe: slope, depth to rock.	Severe: slope, seepage, depth to rock.	Severe: slope, depth to rock, seepage.	Severe: slope, seepage, depth to rock.	Poor: slope, small stones, depth to rock.	Severe: slope.
Weikert	Severe: depth to rock, slope.	Severe: seepage, depth to rock, slope.	Severe: depth to rock, seepage, slope.	Severe: depth to rock, slope, seepage.	Poor: depth to rock, seepage, small stones.	Severe: slope.

See footnotes at end of table.

TABLE 12.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill	Application of agricultural waste
BnD3*, BnF3*, BnG3*:						
Berks	Severe: slope, depth to rock, seepage.	Severe: slope, seepage, depth to rock, slippage.	Severe: slope, depth to rock, seepage, slippage.	Severe: slope, depth to rock, seepage, slippage.	Poor: depth to rock, slope, small stones.	Severe: slope.
Weikert	Severe: slope, depth to rock, slippage.	Severe: seepage, depth to rock, slope, slippage.	Severe: depth to rock, seepage, slope, slippage.	Severe: depth to rock, seepage, slope, slippage.	Poor: depth to rock, slope, small stones.	Severe: slope.
BrC Blackthorn**	Moderate: slope.	Severe: seepage, slope.	Moderate: slope.	Moderate: slope.	Poor: small stones.	Moderate: slope, large stones.
BrD Blackthorn**	Severe: slope.	Severe: seepage, slope.	Severe: slope.	Severe: slope.	Poor: small stones, slope.	Severe: slope.
BsC Blackthorn**	Moderate: slope.	Severe: seepage, slope.	Moderate: slope.	Moderate: slope.	Poor: small stones.	Moderate: slope.
BsE, BsF Blackthorn**	Severe: slope.	Severe: seepage, slope.	Severe: slope.	Severe: slope.	Poor: small stones, slope.	Severe: slope.
BtC*:						
Blackthorn**	Moderate: slope.	Severe: seepage, slope.	Moderate: slope.	Moderate: slope.	Poor: small stones.	Moderate: slope.
Dekalb	Severe: depth to rock, poor filter.	Severe: slope, depth to rock, seepage.	Severe: depth to rock, seepage.	Severe: seepage, depth to rock.	Poor: small stones, depth to rock, thin layer.	Severe: poor filter.
Elliber	Moderate: slope, large stones.	Severe: seepage, slope.	Severe: seepage.	Severe: seepage.	Poor: seepage, small stones.	Severe: poor filter.
BtE*:						
Blackthorn**	Severe: slope.	Severe: seepage, slope.	Severe: slope.	Severe: slope.	Poor: small stones, slope.	Severe: slope.

See footnotes at end of table.

TABLE 12.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill	Application of agricultural waste
BtE*:						
Dekalb	Severe: slope, depth to rock, poor filter.	Severe: slope, depth to rock, seepage.	Severe: slope, depth to rock, seepage.	Severe: slope, seepage, depth to rock.	Poor: slope, small stones, depth to rock.	Severe: poor filter, slope.
Elliber	Severe: slope.	Severe: seepage, slope.	Severe: seepage, slope.	Severe: seepage, slope.	Poor: seepage, small stones, slope.	Severe: poor filter, slope.
BuB Buchanan	Severe: wetness, percs slowly.	Severe: wetness***.	Moderate: wetness.	Moderate: wetness.	Poor: small stones.	Moderate: wetness.
BuC Buchanan	Severe: wetness, percs slowly.	Severe: slope, wetness***.	Moderate: slope, wetness.	Moderate: slope, wetness.	Poor: small stones.	Moderate: wetness, slope.
CaC Calvin	Severe: depth to rock.	Severe: slope, depth to rock, seepage.	Severe: depth to rock, seepage.	Severe: depth to rock, seepage.	Poor: depth to rock, small stones.	Moderate: slope.
CaD Calvin	Severe: depth to rock, slope.	Severe: slope, depth to rock, seepage.	Severe: depth to rock, seepage, slope.	Severe: depth to rock, seepage, slope.	Poor: depth to rock, small stones, slope.	Severe: slope.
CdC*:						
Calvin	Severe: depth to rock.	Severe: slope, depth to rock, seepage.	Severe: depth to rock, seepage.	Severe: depth to rock, seepage.	Poor: depth to rock, small stones, thin layer.	Moderate: slope.
Dekalb	Severe: depth to rock, poor filter.	Severe: slope, depth to rock, seepage.	Severe: depth to rock, seepage.	Severe: seepage, depth to rock.	Poor: depth to rock, small stones, thin layer.	Severe: poor filter.
Hazleton	Severe: poor filter.	Severe: slope, seepage.	Severe: seepage, depth to rock.	Severe: seepage.	Poor: small stones.	Severe: poor filter.

See footnotes at end of table.

TABLE 12.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill	Application of agricultural waste
CdE*, CdF*, CdG*:						
Calvin	Severe: slope, depth to rock.	Severe: slope, depth to rock, seepage.	Severe: depth to rock, seepage, slope.	Severe: depth to rock, seepage, slope.	Poor: depth to rock, small stones, slope.	Severe: slope.
Dekalb	Severe: slope, depth to rock, poor filter.	Severe: slope, depth to rock, seepage.	Severe: slope, depth to rock, seepage.	Severe: slope, seepage, depth to rock.	Poor: slope, small stones, depth to rock.	Severe: poor filter, slope.
Hazleton	Severe: poor filter, slope.	Severe: slope, seepage.	Severe: slope, seepage, depth to rock.	Severe: slope, seepage.	Poor: slope, small stones.	Severe: poor filter, slope.
CeC Cateache**	Severe: depth to rock.	Severe: slope, depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Poor: depth to rock, thin layer.	Moderate: slope.
CfC Cateache**	Severe: depth to rock.	Severe: slope, depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Poor: depth to rock, thin layer.	Moderate: slope, large stones.
CfE, CfF, CfG Cateache**	Severe: slope, depth to rock, slippage.	Severe: slope, depth to rock, slippage.	Severe: slope, depth to rock, slippage.	Severe: slope, depth to rock, slippage.	Poor: slope, depth to rock, thin layer.	Severe: slope.
Ch Chagrin	Severe: flooding.	Severe: flooding****.	Severe: flooding, wetness.	Severe: flooding.	Good	Moderate: flooding.
CkB Clarksburg	Severe: wetness, percs slowly.	Severe: wetness***.	Severe: wetness.	Moderate: wetness.	Fair: small stones, wetness.	Moderate: wetness.
CkC, ClC Clarksburg	Severe: wetness, percs slowly.	Severe: slope, wetness***.	Severe: wetness.	Moderate: wetness, slope.	Fair: slope, small stones, wetness.	Moderate: wetness, slope.
ClD Clarksburg	Severe: wetness, percs slowly, slope.	Severe: slope, wetness***.	Severe: wetness, slope.	Severe: slope.	Poor: slope.	Severe: slope.

See footnotes at end of table.

TABLE 12.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill	Application of agricultural waste
DeF*:						
Dekalb-------------	Severe: slope, depth to rock, poor filter.	Severe: slope, depth to rock, seepage.	Severe: slope, depth to rock, seepage.	Severe: slope, seepage, depth to rock.	Poor: slope, small stones, depth to rock.	Severe: poor filter, slope.
Elliber------------	Severe: slope.	Severe: seepage, slope.	Severe: seepage, slope.	Severe: seepage, slope.	Poor: seepage, small stones, slope.	Severe: poor filter, slope.
Blackthorn---------	Severe: slope.	Severe: seepage, slope.	Severe: slope.	Severe: slope.	Poor: small stones, slope.	Severe: slope.
DfG*:						
Dekalb-------------	Severe: slope, depth to rock, poor filter.	Severe: slope, depth to rock, seepage.	Severe: slope, depth to rock, seepage.	Severe: slope, seepage, depth to rock.	Poor: slope, small stones, depth to rock.	Severe: poor filter, slope.
Elliber------------	Severe: slope.	Severe: seepage, slope.	Severe: seepage, slope.	Severe: seepage, slope.	Poor: seepage, small stones, slope.	Severe: poor filter, slope.
Du------------------ Dunning	Severe: flooding, wetness, percs slowly.	Severe: flooding****, wetness***.	Severe: flooding, wetness, too clayey.	Severe: flooding, wetness.	Poor: too clayey, hard to pack, wetness.	Severe: poor filter, slope.
EdC----------------- Edom**	Severe: percs slowly.	Severe: slope.	Severe: depth to rock, too clayey.	Moderate: depth to rock, slope.	Poor: too clayey, hard to pack.	Moderate: slope.
EdD, EdE, EdF------- Edom**	Severe: percs slowly, slope.	Severe: slope.	Severe: depth to rock, slope, too clayey.	Severe: slope.	Poor: too clayey, hard to pack, slope.	Severe: slope.
ElC----------------- Elliber	Moderate: slope, large stones.	Severe: seepage, slope.	Severe: seepage.	Severe: seepage.	Poor: seepage, small stones.	Severe: poor filter.
ElD, ElE, ElF------- Elliber	Severe: slope.	Severe: seepage, slope.	Severe: seepage, slope.	Severe: seepage, slope.	Poor: seepage, small stones, slope.	Severe: poor filter, slope.

See footnotes at end of table.

TABLE 12.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill	Application of agricultural waste
ErB Ernest	Severe: percs slowly, wetness.	Severe: wetness***.	Moderate: wetness.	Moderate: wetness.	Fair: small stones, wetness.	Moderate: wetness.
ErC Ernest	Severe: percs slowly, wetness.	Severe: slope, wetness***.	Moderate: slope, wetness.	Moderate: slope, wetness.	Fair: small stones.	Moderate: wetness, slope.
ErD Ernest	Severe: slope, percs slowly, wetness.	Severe: slope, wetness***.	Severe: slope.	Severe: slope.	Poor: slope.	Severe: slope.
GaC Gauley	Severe: depth to rock, large stones.	Severe: seepage, depth to rock, slope.	Severe: depth to rock, seepage, large stones.	Severe: depth to rock, seepage, large stones.	Poor: depth to rock, large stones, thin layer.	Severe: large stones.
GaE, GaF, GaG Gauley	Severe: depth to rock, slope, large stones.	Severe: seepage, depth to rock, slope.	Severe: depth to rock, seepage, slope.	Severe: depth to rock, seepage, slope.	Poor: depth to rock, large stones, slope.	Severe: slope, large stones.
HdC*: Hazleton	Severe: poor filter.	Severe: slope, seepage.	Severe: seepage, depth to rock.	Severe: seepage.	Poor: small stones.	Severe: poor filter.
Dekalb	Severe: depth to rock, poor filter.	Severe: slope, depth to rock, seepage.	Severe: depth to rock, seepage.	Severe: seepage, depth to rock.	Poor: small stones, depth to rock.	Severe: poor filter.
HdE*, HdF*, HdG*: Hazleton	Severe: poor filter, slope.	Severe: slope, seepage.	Severe: slope, seepage, depth to rock.	Severe: slope, seepage.	Poor: slope, small stones.	Severe: poor filter, slope.
Dekalb	Severe: slope, depth to rock, poor filter.	Severe: slope, depth to rock, seepage.	Severe: slope, depth to rock, seepage.	Severe: slope, seepage, depth to rock.	Poor: slope, small stones, depth to rock.	Severe: poor filter, slope.
LaC Laidig	Severe: percs slowly, wetness.	Severe: seepage, slope, wetness***.	Moderate: wetness, slope.	Moderate: slope.	Fair: slope, small stones, wetness.	Moderate: slope.

See footnotes at end of table.

TABLE 12.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill	Application of agricultural waste
LaD, LdE----------- Laidig	Severe: slope, percs slowly, wetness.	Severe: seepage, slope, wetness***.	Severe: slope.	Severe: slope.	Poor: slope.	Severe: slope.
LeF----------------- Laidig	Severe: slope, percs slowly, wetness.	Severe: seepage, slope, wetness***.	Severe: slope.	Severe: slope.	Poor: slope.	Severe: slope.
LgC*:						
Laidig-------------	Severe: percs slowly, wetness.	Severe: seepage, slope, wetness***.	Moderate: slope, wetness.	Moderate: slope.	Fair: slope, small stones, wetness.	Moderate: slope.
Buchanan-----------	Severe: wetness, percs slowly.	Severe: slope, wetness.	Severe: wetness.	Moderate: slope, wetness.	Poor: small stones.	Moderate: wetness, slope.
LhC*:						
Lehew--------------	Severe: depth to rock, poor filter.	Severe: slope, depth to rock, seepage.	Severe: depth to rock, seepage.	Severe: seepage, depth to rock.	Poor: depth to rock, small stones.	Severe: poor filter.
Dekalb-------------	Severe: depth to rock, poor filter.	Severe: slope, depth to rock, seepage.	Severe: seepage, depth to rock.	Severe: seepage, depth to rock.	Poor: small stones, depth to rock.	Severe: poor filter.
LhD*:						
Lehew--------------	Severe: slope, depth to rock, poor filter.	Severe: slope, depth to rock, seepage.	Severe: slope, depth to rock, seepage.	Severe: slope, seepage, depth to rock.	Poor: depth to rock, small stones, slope.	Severe: poor filter, slope.
Dekalb-------------	Severe: slope, depth to rock, poor filter.	Severe: slope, depth to rock, seepage.	Severe: slope, seepage, depth to rock.	Severe: slope, seepage, depth to rock.	Poor: slope, small stones, depth to rock.	Severe: poor filter, slope.
LkC*:						
Lehew--------------	Severe: depth to rock, poor filter.	Severe: slope, depth to rock, seepage.	Severe: depth to rock, seepage.	Severe: seepage, depth to rock.	Poor: depth to rock, small stones.	Severe: poor filter.

See footnotes at end of table.

TABLE 12.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill	Application of agricultural waste
LkC*:						
Hazleton	Severe: poor filter.	Severe: slope, seepage.	Severe: seepage, depth to rock.	Severe: seepage.	Poor: small stones.	Severe: poor filter.
Dekalb	Severe: depth to rock, poor filter.	Severe: slope, depth to rock, seepage.	Severe: depth to rock, seepage.	Severe: seepage, depth to rock.	Poor: small stones, depth to rock.	Severe: poor filter.
LkE*, LkF*, LkG*:						
Lehew	Severe: slope, depth to rock, poor filter.	Severe: slope, depth to rock, seepage.	Severe: slope, depth to rock, seepage.	Severe: slope, seepage, depth to rock.	Poor: depth to rock, small stones, slope.	Severe: poor filter, slope.
Hazleton	Severe: poor filter, slope.	Severe: slope, seepage.	Severe: slope, seepage, depth to rock.	Severe: slope, seepage.	Poor: slope, small stones.	Severe: poor filter, slope.
Dekalb	Severe: slope, depth to rock, poor filter.	Severe: slope, depth to rock, seepage.	Severe: slope, depth to rock, seepage.	Severe: slope, seepage, depth to rock.	Poor: slope, small stones, depth to rock.	Severe: poor filter, slope.
LmF*:						
Lithic Udorthents.						
Rock outcrop.						
Lo Lobdell	Severe: flooding, wetness.	Severe: seepage, flooding****, wetness***.	Severe: flooding, seepage, wetness.	Severe: flooding, seepage, wetness.	Fair: wetness.	Moderate: wetness, flooding.
MaC Mandy	Severe: depth to rock.	Severe: depth to rock, slope.	Severe: depth to rock.	Severe: depth to rock.	Poor: depth to rock, small stones.	Moderate: slope.
MaD, MdE, MdF Mandy	Severe: slope, depth to rock.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Poor: depth to rock, small stones, slope.	Severe: slope.
Mn Massanetta	Severe: flooding.	Severe: flooding****.	Severe: flooding.	Severe: flooding.	Good	Moderate: flooding.

See footnotes at end of table.

TABLE 12.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill	Application of agricultural waste
MoB Monongahela	Severe: percs slowly, wetness.	Severe: wetness***.	Severe: wetness.	Moderate: wetness.	Fair: small stones, wetness.	Moderate: wetness.
MoC Monongahela	Severe: percs slowly, wetness.	Severe: slope, wetness***.	Severe: wetness.	Moderate: slope, wetness.	Fair: small stones, wetness, slope.	Moderate: wetness.
OeC Opequon**	Severe: depth to rock, percs slowly.	Severe: slope, depth to rock.	Severe: depth to rock, too clayey.	Severe: depth to rock.	Poor: depth to rock, too clayey, hard to pack.	Moderate: slope, depth to rock.
OeE, OeF, OeG Opequon**	Severe: slope, depth to rock, percs slowly.	Severe: slope, depth to rock.	Severe: slope, depth to rock, too clayey.	Severe: depth to rock, slope.	Poor: depth to rock, too clayey, slope.	Severe: slope.
OnC3*:						
Opequon**	Severe: depth to rock, percs slowly.	Severe: slope, depth to rock.	Severe: depth to rock, too clayey.	Severe: depth to rock.	Poor: depth to rock, too clayey, hard to pack.	Moderate: slope, depth to rock.
Caneyville**	Severe: depth to rock, percs slowly.	Severe: depth to rock, slope.	Severe: depth to rock, too clayey.	Severe: depth to rock.	Poor: depth to rock, too clayey, hard to pack.	Moderate: slope.
OnD3*, OnE3*, OnF3*:						
Opequon**	Severe: slope, depth to rock, percs slowly, slippage.	Severe: slope, depth to rock, slippage.	Severe: slope, depth to rock, too clayey, slippage.	Severe: depth to rock, slope, slippage.	Poor: depth to rock, too clayey, slope.	Severe: slope.
Caneyville**	Severe: depth to rock, percs slowly, slope, slippage.	Severe: depth to rock, slope, slippage.	Severe: depth to rock, slope, too clayey, slippage.	Severe: depth to rock, slope, slippage.	Poor: depth to rock, too clayey, slope.	Severe: slope.
Or Orrville	Severe: flooding, wetness.	Severe: seepage, flooding****, wetness***.	Severe: flooding, seepage, wetness.	Severe: flooding, wetness.	Poor: wetness.	Severe: wetness.

See footnotes at end of table.

TABLE 12.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill	Application of agricultural waste
Po, Pt-------------- Potomac	Severe: flooding, poor filter.	Severe: seepage, flooding****.	Severe: flooding, seepage.	Severe: flooding, seepage.	Poor: seepage, small stones.	Severe: poor filter.
Pu----------------- Purdy	Severe: wetness, percs slowly.	Severe: wetness***.	Severe: wetness, too clayey.	Severe: wetness.	Poor: wetness, too clayey, hard to pack.	Severe: wetness.
Qu*. Quarry						
Ro*: Rock outcrop.						
Rubble land.						
RuF---------------- Rushtown	Severe: poor filter, slope.	Severe: seepage, slope.	Severe: slope, seepage, small stones.	Severe: slope, seepage.	Poor: seepage, small stones, slope.	Severe: poor filter, slope.
ShC---------------- Shouns	Moderate: percs slowly, slope.	Severe: slope.	Moderate: slope.	Moderate: slope.	Fair: slope.	Moderate: slope.
ShE---------------- Shouns	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Poor: slope.	Severe: slope.
SnC---------------- Shouns	Moderate: percs slowly, slope.	Severe: slope.	Moderate: slope.	Moderate: slope.	Poor: large stones.	Moderate: slope, large stones.
SnE, SnF----------- Shouns	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Poor: slope, large stones.	Severe: slope.
SoC---------------- Shouns	Severe: large stones.	Severe: slope, large stones.	Severe: large stones.	Moderate: slope.	Poor: large stones.	Severe: large stones.
SoE, SoF----------- Shouns	Severe: slope, large stones.	Severe: slope, large stones.	Severe: slope, large stones.	Severe: slope.	Poor: slope, large stones.	Severe: slope, large stones.

See footnotes at end of table.

TABLE 12.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill	Application of agricultural waste
SrB----------------- Simoda	Severe: wetness, percs slowly.	Severe: slope, wetness***.	Severe: wetness, depth to rock.	Moderate: wetness, slope, depth to rock.	Poor: large stones.	Severe: large stones.
Tg------------------ Tioga	Severe: flooding, poor filter.	Severe: flooding****, seepage.	Severe: flooding, seepage.	Severe: flooding, seepage.	Fair: small stones.	Moderate: flooding.
ToB----------------- Toms	Severe: wetness, percs slowly.	Severe: wetness***.	Severe: wetness, too clayey.	Severe: wetness.	Poor: too clayey, hard to pack, wetness.	Severe: wetness.
TrC----------------- Trussel	Severe: wetness, percs slowly.	Severe: slope, wetness***.	Severe: wetness.	Severe: wetness.	Poor: wetness.	Severe: wetness.
TsC----------------- Trussel	Severe: wetness, percs slowly.	Severe: slope, wetness***.	Severe: wetness.	Severe: wetness.	Poor: wetness, large stones.	Severe: wetness, large stones.
TyB----------------- Tygart	Severe: percs slowly, wetness.	Severe: wetness***.	Severe: wetness, too clayey.	Severe: wetness.	Poor: too clayey, hard to pack, wetness.	Severe: wetness.
Ud. Udorthents						

* See description of the map unit for composition and behavior characteristics of the map unit.

** Ground water may become polluted in areas underlain by cavernous limestone or pervious bedrock.

*** Disregard wetness if a layer at least 20 inches thick has permeability of less than 0.2 inches per hour.

**** If flood water will not enter or damage sewage lagoons (velocity is low and depth of water is less than 5 feet), disregard flooding.

TABLE 13.--CONSTRUCTION MATERIALS

(Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "good," "fair," and other terms. Absence of an entry indicates that the soil was not rated. The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation)

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
AgB Allegheny	Good	Improbable: excess fines.	Improbable: excess fines.	Fair: small stones, area reclaim.
AgC Allegheny	Good	Improbable: excess fines.	Improbable: excess fines.	Fair: small stones, area reclaim, slope.
BcC*:				
Belmont	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey, small stones, slope.
Cateache	Poor: depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones.
BcD*:				
Belmont	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
Cateache	Poor: depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope, small stones.
BeC*:				
Belmont	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey, slope, small stones.
Cateache	Poor: depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones.
BeE*, BeF*, BeG*:				
Belmont	Poor: slope, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
Cateache	Poor: slope, depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope, small stones.
BkC Berks**	Poor: depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones.
BkD Berks**	Poor: depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope, small stones.
BkE, BkF, BmE, BmF, BmG Berks**	Poor: slope, depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope, small stones.

See footnotes at end of table.

TABLE 13.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
BnC*:				
Berks**	Poor: depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones.
Weikert**	Poor: depth to rock.	Improbable: small stones.	Improbable: thin layer.	Poor: depth to rock, small stones.
BnD*, BnD3*:				
Berks**	Poor: depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope, small stones.
Weikert**	Poor: depth to rock.	Improbable: small stones.	Improbable: thin layer.	Poor: depth to rock, small stones, slope.
BnF*, BnF3*, BnG*, BnG3*:				
Berks**	Poor: slope, depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope, small stones.
Weikert**	Poor: depth to rock, slope.	Improbable: small stones.	Improbable: thin layer.	Poor: depth to rock, small stones, slope.
BrC Blackthorn	Good	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim.
BrD Blackthorn	Fair: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, slope, area reclaim.
BsC Blackthorn	Good	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim.
BsE, BsF Blackthorn	Poor: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, slope, area reclaim.
BtC*:				
Blackthorn	Good	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim.
Dekalb	Poor: depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones.
Elliber***	Fair: large stones.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim.

See footnotes at end of table.

TABLE 13.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
BtE*:				
Blackthorn	Poor: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, slope, area reclaim.
Dekalb	Poor: slope, depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope, small stones.
Elliber***	Poor: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim, slope.
BuB, BuC Buchanan	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim.
CaC Calvin	Poor: depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones.
CaD Calvin	Poor: depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, slope.
CdC*:				
Calvin	Poor: depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones.
Dekalb	Poor: depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones.
Hazleton	Fair: depth to rock, thin layer, large stones.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones.
CdE*, CdF*, CdG*:				
Calvin	Poor: slope, depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope, small stones.
Dekalb	Poor: slope, depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope, small stones.
Hazleton	Poor: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope, small stones.
CeC, CfC Cateache	Poor: depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones.
CfE, CfF, CfG Cateache	Poor: slope, depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope, small stones.
Ch Chagrin	Good	Improbable: excess fines.	Improbable: excess fines.	Fair: small stones.

See footnotes at end of table.

TABLE 13.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
CkB, CkC, ClC--------- Clarksburg	Fair: wetness, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim.
ClD------------------- Clarksburg	Fair: wetness, shrink-swell, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim, slope.
DeF*:				
Dekalb----------------	Poor: slope, depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope, small stones.
Elliber***-----------	Poor: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim, slope.
Blackthorn-----------	Poor: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, slope, area reclaim.
DfG*:				
Dekalb----------------	Poor: slope, depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope, small stones.
Elliber***-----------	Poor: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim, slope.
Du-------------------- Dunning	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, wetness.
EdC------------------- Edom	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim, too clayey.
EdD------------------- Edom	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim, slope, too clayey.
EdE, EdF-------------- Edom	Poor: low strength, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim, slope, too clayey.
ElC------------------- Elliber***	Fair: large stones.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim.
ElD------------------- Elliber***	Fair: large stones, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim, slope.

See footnotes at end of table.

TABLE 13.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
ElE, ElF Elliber***	Poor: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim, slope.
ErB, ErC Ernest	Fair: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones.
ErD Ernest	Fair: low strength, wetness, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, slope.
GaC Gauley	Poor: large stones, depth to rock.	Improbable: excess fines, large stones.	Improbable: excess fines, large stones.	Poor: large stones.
GaE, GaF, GaG Gauley	Poor: large stones, slope, depth to rock.	Improbable: excess fines, large stones.	Improbable: excess fines, large stones.	Poor: large stones, slope.
HdC*: Hazleton	Fair: depth to rock, thin layer, large stones.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones.
Dekalb	Poor: depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones.
HdE*, HdF*, HdG*: Hazleton	Poor: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope, small stones.
Dekalb	Poor: slope, depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope, small stones.
LaC Laidig	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim.
LaD Laidig	Fair: wetness, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim, slope.
LdE Laidig	Poor: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim, slope.
LeF Laidig	Poor: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope, small stones, area reclaim.

See footnotes at end of table.

TABLE 13.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
LgC*:				
Laidig	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim.
Buchanan	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim.
LhC*:				
Lehew	Poor: depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones.
Dekalb	Poor: depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones.
LhD*:				
Lehew	Poor: depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope, small stones.
Dekalb	Poor: depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope, small stones.
LkC*:				
Lehew	Poor: depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones.
Hazleton	Fair: depth to rock, thin layer, large stones.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones.
Dekalb	Poor: depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones.
LkE*, LkF*, LkG*:				
Lehew	Poor: depth to rock, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, slope.
Hazleton	Poor: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope, small stones.
Dekalb	Poor: slope, depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope, small stones.
LmF*:				
Lithic Udorthents.				
Rock outcrop.				

See footnotes at end of table.

TABLE 13.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
Lo-------------------- Lobdell	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Fair: small stones.
MaC------------------- Mandy	Poor: depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones.
MaD------------------- Mandy	Poor: depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, slope.
MdE, MdF-------------- Mandy	Poor: depth to rock, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, slope.
Mn-------------------- Massanetta	Fair: low strength, thin layer.	Improbable: excess fines.	Improbable: excess fines.	Fair: small stones.
MoB------------------- Monongahela	Fair: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Fair: small stones.
MoC------------------- Monongahela	Fair: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Fair: slope, small stones.
OeC------------------- Opequon	Poor: depth to rock, low strength, shrink-swell.	Improbable: excess fines, thin layer.	Improbable: excess fines, thin layer.	Poor: depth to rock, too clayey, small stones.
OeE, OeF, OeG--------- Opequon	Poor: depth to rock, low strength, slope.	Improbable: excess fines, thin layer.	Improbable: excess fines, thin layer.	Poor: depth to rock, too clayey, small stones, slope.
OnC3*:				
Opequon--------------	Poor: depth to rock, low strength, shrink-swell.	Improbable: excess fines, thin layer.	Improbable: excess fines, thin layer.	Poor: depth to rock, too clayey, small stones.
Caneyville-----------	Poor: depth to rock, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, too clayey.
OnD3*:				
Opequon--------------	Poor: depth to rock, low strength, shrink-swell.	Improbable: excess fines, thin layer.	Improbable: excess fines, thin layer.	Poor: depth to rock, too clayey, small stones, slope.
Caneyville-----------	Poor: depth to rock, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope, small stones, too clayey.

See footnotes at end of table.

TABLE 13.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
OnE3*, OnF3*:				
Opequon	Poor: depth to rock, low strength, slope.	Improbable: excess fines, thin layer.	Improbable: excess fines, thin layer.	Poor: depth to rock, too clayey, small stones, slope.
Caneyville	Poor: depth to rock, low strength, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope, small stones, too clayey.
Or Orrville	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Fair: small stones, area reclaim.
Po, Pt Potomac	Fair: large stones.	Improbable: small stones.	Probable	Poor: large stones, area reclaim, small stones.
Pu Purdy	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness, too clayey.
Qu*. Quarry				
Ro*:				
Rock outcrop.				
Rubble land.				
RuF Rushtown	Poor: slope.	Improbable: small stones.	Probable	Poor: slope, small stones.
ShC Shouns	Fair: large stones.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones.
ShE Shouns	Poor: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope, small stones.
SnC Shouns	Fair: large stones.	Improbable: excess fines.	Improbable: excess fines.	Poor: large stones.
SnE, SnF Shouns	Poor: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
SoC Shouns	Poor: large stones.	Improbable: excess fines, large stones, small stones.	Improbable: excess fines, large stones.	Poor: large stones.

See footnotes at end of table.

TABLE 13.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
SoE, SoF: Shouns	Poor: slope, large stones.	Improbable: excess fines, large stones, small stones.	Improbable: excess fines, large stones.	Poor: slope, large stones.
SrB: Simoda	Fair: depth to rock, wetness, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: large stones.
Tg: Tioga	Good	Improbable: excess fines.	Improbable: excess fines.	Fair: small stones, area reclaim.
ToB: Toms	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, wetness.
TrC: Trussel	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness, small stones.
TsC: Trussel	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: large stones, wetness.
TyB: Tygart	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness, too clayey.
Ud. Udorthents				

* See description of the map unit for composition and behavior characteristics of the map unit.

** The rippable shale underlying these soils commonly is excavated for use as roadfill.

*** This extremely cherty soil commonly is excavated for use as roadfill.

TABLE 14.--WATER MANAGEMENT

(Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe." Absence of an entry indicates that the soil was not evaluated. The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation)

Soil name and map symbol	Limitations for--		Features affecting--		
	Pond reservoir areas	Embankments, dikes, and levees	Drainage	Terraces and diversions	Grassed waterways
AgB----- Allegheny	Moderate: seepage, slope.	Severe: piping.	Deep to water----	Favorable----	Favorable.
AgC----- Allegheny	Severe: slope.	Severe: piping.	Deep to water----	Slope----	Slope.
BcC*, BcD*:					
Belmont-----	Severe: slope.	Moderate: thin layer.	Deep to water----	Slope----	Slope.
Cateache-----	Severe: slope, slippage.	Severe: thin layer, piping.	Deep to water----	Slope, depth to rock, slippage.	Slope, depth to rock.
BeC*, BeE*, BeF*, BeG*:					
Belmont-----	Severe: slope.	Moderate: thin layer.	Deep to water----	Slope----	Slope.
Cateache-----	Severe: slope, slippage.	Severe: piping.	Deep to water----	Slope, depth to rock, slippage.	Slope, depth to rock.
BkC, BkD, BkE, BkF----- Berks	Severe: seepage, slope.	Severe: seepage.	Deep to water----	Depth to rock, slope, large stones.	Droughty, depth to rock, slope.
BmE, BmF, BmG----- Berks	Severe: seepage, slope.	Severe: seepage.	Deep to water----	Slope, depth to rock, large stones.	Depth to rock, large stones, slope.
BnC*, BnD*, BnF*, BnG*:					
Berks-----	Severe: seepage, slope.	Severe: seepage.	Deep to water----	Depth to rock, slope, large stones.	Droughty, depth to rock, slope.
Weikert-----	Severe: depth to rock, slope, seepage.	Severe: seepage, thin layer.	Deep to water----	Slope, large stones, depth to rock.	Large stones, slope, depth to rock.
BnD3*, BnF3*, BnG3*:					
Berks-----	Severe: seepage, slope, slippage.	Severe: seepage.	Deep to water----	Depth to rock, slope, large stones, slippage.	Droughty, depth to rock, slope.
Weikert-----	Severe: depth to rock, slope, slippage.	Severe: seepage, thin layer.	Deep to water----	Slope, large stones, depth to rock, slippage.	Large stones, slope, depth to rock.

See footnote at end of table.

TABLE 14.--WATER MANAGEMENT--Continued

Soil name and map symbol	Limitations for--		Features affecting--		
	Pond reservoir areas	Embankments, dikes, and levees	Drainage	Terraces and diversions	Grassed waterways
BrC, BrD, BsC, BsE, BsF Blackthorn	Severe: seepage, slope.	Severe: seepage.	Deep to water	Slope, large stones.	Large stones, slope.
BtC*, BtE*: Blackthorn	Severe: seepage, slope.	Severe: seepage.	Deep to water	Slope, large stones.	Large stones, slope.
Dekalb	Severe: seepage, slope.	Severe: seepage, piping, large stones.	Deep to water	Slope, depth to rock, large stones.	Slope, large stones, droughty.
Elliber	Severe: seepage, slope.	Severe: seepage.	Deep to water	Slope, large stones.	Large stones, slope, droughty.
BuB Buchanan	Moderate: seepage, slope.	Moderate: seepage, wetness.	Percs slowly, slope.	Percs slowly, rooting depth.	Percs slowly, rooting depth.
BuC Buchanan	Severe: slope.	Moderate: seepage, wetness.	Percs slowly, slope.	Slope, percs slowly, rooting depth.	Slope, percs slowly, rooting depth.
CaC, CaD Calvin	Severe: seepage, slope.	Severe: piping.	Deep to water	Slope, depth to rock.	Large stones, slope, droughty, depth to rock.
CdC*, CdE*, CdF*, CdG*:					
Calvin	Severe: seepage, slope.	Severe: piping.	Deep to water	Slope, large stones, depth to rock.	Large stones, slope, droughty.
Dekalb	Severe: seepage, slope.	Severe: piping, seepage, large stones.	Deep to water	Slope, depth to rock, large stones.	Slope, large stones, droughty.
Hazleton	Severe: seepage, slope.	Severe: seepage, large stones.	Deep to water	Large stones, slope, too sandy.	Large stones, slope, droughty.
CeC, CfC, CfE, CfF, CfG Cateache	Severe: slope, slippage.	Severe: piping.	Deep to water	Slope, depth to rock, slippage.	Slope, depth to rock.
Ch Chagrin	Moderate: seepage.	Severe: piping.	Deep to water	Favorable	Favorable.
CkB Clarksburg	Moderate: seepage, slope.	Moderate: piping, wetness.	Percs slowly, slope.	Wetness, percs slowly, rooting depth.	Rooting depth, percs slowly.
CkC Clarksburg	Severe: slope.	Moderate: piping, wetness.	Percs slowly, slope.	Slope, wetness, percs slowly.	Slope, rooting depth, percs slowly.

See footnote at end of table.

TABLE 14.--WATER MANAGEMENT--Continued

Soil name and map symbol	Limitations for--		Features affecting--		
	Pond reservoir areas	Embankments, dikes, and levees	Drainage	Terraces and diversions	Grassed waterways
ClC, ClD Clarksburg	Severe: slope.	Moderate: piping, wetness.	Percs slowly, slope.	Slope, wetness, percs slowly.	Slope, rooting depth, percs slowly.
DeF*: Dekalb	Severe: seepage, slope.	Severe: piping, seepage, large stones.	Deep to water	Slope, depth to rock, large stones.	Slope, large stones, droughty.
Elliber	Severe: seepage, slope.	Severe: seepage.	Deep to water	Slope, large stones.	Large stones, slope.
Blackthorn	Severe: seepage, slope.	Severe: seepage.	Deep to water	Slope, large stones.	Large stones, slope.
DfG*: Dekalb	Severe: seepage, slope.	Severe: piping, seepage, large stones.	Deep to water	Slope, depth to rock, large stones.	Slope, large stones, droughty.
Elliber	Severe: seepage, slope.	Severe: seepage.	Deep to water	Slope, large stones.	Large stones, slope.
Du Dunning	Slight	Severe: wetness.	Percs slowly, flooding.	Erodes easily, wetness, percs slowly.	Wetness, erodes easily, percs slowly.
EdC, EdD, EdE, EdF Edom	Severe: slope.	Moderate: hard to pack, thin layer.	Deep to water	Slope	Slope.
ElC, ElD, ElE, ElF Elliber	Severe: seepage, slope.	Severe: seepage.	Deep to water	Slope, large stones.	Large stones, slope.
ErB Ernest	Moderate: slope.	Moderate: piping, wetness.	Percs slowly, slope.	Erodes easily, rooting depth, percs slowly.	Erodes easily, rooting depth, percs slowly.
ErC, ErD Ernest	Severe: slope.	Moderate: piping, wetness.	Percs slowly, slope.	Slope, erodes easily, rooting depth.	Rooting depth, slope, erodes easily.
GaC, GaE, GaF, GaG Gauley	Severe: slope, seepage, large stones.	Severe: piping, large stones.	Deep to water	Slope, large stones, depth to rock.	Large stones, slope, depth to rock.
HdC*, HdE*, HdF*, HdG*: Hazleton	Severe: seepage, slope.	Severe: seepage, large stones.	Deep to water	Large stones, slope, too sandy.	Large stones, slope, droughty.

See footnote at end of table.

TABLE 14.--WATER MANAGEMENT--Continued

Soil name and map symbol	Limitations for--		Features affecting--		
	Pond reservoir areas	Embankments, dikes, and levees	Drainage	Terraces and diversions	Grassed waterways
HdC*, HdE*, HdF*, HdG*:					
Dekalb	Severe: seepage, slope.	Severe: piping, seepage, large stones.	Deep to water	Slope, depth to rock, large stones.	Slope, large stones, droughty.
LaC, LaD Laidig	Severe: seepage, slope.	Severe: piping, seepage.	Deep to water	Slope, rooting depth.	Slope, rooting depth.
LdE Laidig	Severe: seepage, slope.	Severe: piping, seepage.	Deep to water	Slope, large stones, rooting depth.	Slope, large stones, rooting depth.
LeF Laidig	Severe: seepage, slope.	Severe: piping, seepage.	Deep to water	Slope, large stones, rooting depth.	Large stones, slope, rooting depth.
LgC*:					
Laidig	Severe: seepage, slope.	Severe: piping, seepage.	Deep to water	Slope, large stones, rooting depth.	Slope, large stones, rooting depth.
Buchanan	Severe: slope.	Moderate: piping, wetness.	Percs slowly, slope.	Slope, percs slowly, rooting depth.	Slope, percs slowly, rooting depth.
LhC*, LhD*:					
Lehew	Severe: seepage, slope.	Severe: seepage, large stones.	Deep to water	Slope, large stones, depth to rock.	Large stones, slope, droughty.
Dekalb	Severe: seepage, slope.	Severe: piping, seepage, large stones.	Deep to water	Slope, large stones, depth to rock.	Slope, large stones, droughty.
LkC*, LkE*, LkF*, LkG*:					
Lehew	Severe: seepage, slope.	Severe: seepage, large stones.	Deep to water	Slope, large stones, depth to rock.	Slope, large stones, droughty.
Hazleton	Severe: seepage, slope.	Severe: seepage, large stones.	Deep to water	Large stones, slope, too sandy.	Large stones, slope, droughty.
Dekalb	Severe: seepage, slope.	Severe: piping, seepage, large stones.	Deep to water	Slope, depth to rock, large stones.	Slope, large stones, droughty.
LmF*: Lithic Udorthents.					
Rock outcrop.					
Lo Lobdell	Severe: seepage.	Severe: piping.	Flooding, frost action.	Erodes easily, wetness.	Erodes easily.

See footnote at end of table.

TABLE 14.--WATER MANAGEMENT--Continued

Soil name and map symbol	Limitations for-- Pond reservoir areas	Limitations for-- Embankments, dikes, and levees	Features affecting-- Drainage	Features affecting-- Terraces and diversions	Features affecting-- Grassed waterways
MaC, MaD---------- Mandy	Severe: slope.	Severe: piping.	Deep to water----	Slope, depth to rock.	Slope, depth to rock.
MdE, MdF---------- Mandy	Severe: slope.	Severe: piping.	Deep to water----	Slope, large stones, depth to rock.	Large stones, slope, depth to rock.
Mn---------------- Massanetta	Moderate: seepage.	Severe: piping.	Deep to water----	Erodes easily----	Erodes easily.
MoB--------------- Monongahela	Moderate: seepage, slope.	Moderate: piping, wetness.	Percs slowly, slope.	Erodes easily, wetness, rooting depth.	Erodes easily, rooting depth, percs slowly.
MoC--------------- Monongahela	Severe: slope.	Moderate: piping, wetness.	Percs slowly, slope.	Slope, erodes easily, wetness.	Slope, erodes easily, rooting depth.
OeC, OeE, OeF, OeG------------- Opequon	Severe: depth to rock, slope.	Severe: hard to pack, thin layer.	Deep to water----	Slope, depth to rock, erodes easily.	Slope, erodes easily, depth to rock.
OnC3*:					
Opequon----------	Severe: depth to rock, slope.	Severe: hard to pack, thin layer.	Deep to water----	Slope, depth to rock, erodes easily.	Slope, erodes easily, depth to rock.
Caneyville-------	Severe: slope.	Moderate: hard to pack.	Deep to water----	Slope, depth to rock, erodes easily.	Slope, erodes easily, depth to rock.
OnD3*, OnE3*, OnF3*:					
Opequon---------	Severe: depth to rock, slope, slippage.	Severe: hard to pack, thin layer.	Deep to water----	Slope, depth to rock, slippage.	Slope, erodes easily, depth to rock.
Caneyville------	Severe: slope, slippage.	Moderate: hard to pack.	Deep to water----	Slope, depth to rock, slippage.	Slope, erodes easily, depth to rock.
Or---------------- Orrville	Moderate: seepage.	Severe: piping, wetness.	Flooding, frost action.	Erodes easily, wetness.	Wetness, erodes easily.
Po, Pt------------ Potomac	Severe: seepage.	Severe: seepage.	Deep to water----	Large stones, too sandy.	Large stones, droughty.
Pu---------------- Purdy	Slight------------	Severe: wetness.	Percs slowly, frost action.	Erodes easily, wetness, percs slowly.	Wetness, erodes easily, percs slowly.
Qu*. Quarry					
Ro*:					
Rock outcrop.					
Rubble land.					

See footnote at end of table.

TABLE 14.--WATER MANAGEMENT--Continued

Soil name and map symbol	Limitations for--		Features affecting--		
	Pond reservoir areas	Embankments, dikes, and levees	Drainage	Terraces and diversions	Grassed waterways
RuF--------------- Rushtown	Severe: seepage, slope.	Severe: seepage.	Deep to water----	Slope------------	Slope, droughty.
ShC--------------- Shouns	Moderate: seepage.	Moderate: piping.	Deep to water----	Slope------------	Slope.
ShE--------------- Shouns	Severe: slope.	Moderate: piping.	Deep to water----	Slope------------	Slope.
SnC--------------- Shouns	Moderate: seepage.	Moderate: piping.	Deep to water----	Slope------------	Slope.
SnE, SnF---------- Shouns	Severe: slope.	Moderate: piping.	Deep to water----	Slope------------	Slope.
SoC, SoE, SoF----- Shouns	Severe: slope.	Severe: large stones.	Deep to water----	Slope, large stones.	Slope, large stones.
SrB--------------- Simoda	Moderate: slope, depth to rock.	Moderate: wetness, piping.	Percs slowly, slope.	Slope, wetness, percs slowly.	Slope, rooting depth, percs slowly.
Tg---------------- Tioga	Severe: seepage.	Severe: piping.	Deep to water----	Erodes easily----	Erodes easily, droughty.
ToB--------------- Toms	Moderate: slope.	Severe: wetness.	Percs slowly, frost action, slope.	Erodes easily, wetness, percs slowly.	Wetness, erodes easily, percs slowly.
TrC--------------- Trussel	Severe: slope.	Severe: wetness, piping.	Frost action, slope, percs slowly.	Slope, wetness, rooting depth.	Wetness, slope, rooting depth.
TsC--------------- Trussel	Severe: slope.	Severe: wetness, piping.	Frost action, slope, percs slowly.	Slope, wetness, rooting depth.	Slope, wetness, rooting depth.
TyB--------------- Tygart	Moderate: slope.	Severe: wetness.	Percs slowly, slope.	Erodes easily, percs slowly, wetness.	Percs slowly, wetness, erodes easily.
Ud. Udorthents					

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 15.--ENGINEERING INDEX PROPERTIES

(The symbol < means less than; > means more than. Absence of an entry indicates that data were not estimated)

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
AgB, AgC--------- Allegheny	0-8	Loam------------	ML, CL	A-4	0	90-100	80-100	65-100	55-95	<35	NP-10
	8-65	Clay loam, gravelly loam, silt loam.	ML, CL, SM, SC	A-4, A-6	0	90-100	80-100	65-95	35-80	<35	NP-15
BcC*, BcD*: Belmont---------	0-9	Silt loam--------	CL, ML, CL-ML	A-4, A-6	0-5	80-100	75-100	65-100	50-90	20-40	5-15
	9-17	Silty clay loam, silt loam, channery clay loam.	ML, CL-ML, CL	A-4, A-6, A-7	0-5	80-100	75-100	70-100	50-95	25-45	5-20
	17-40	Silty clay loam, channery clay loam, silty clay.	CL	A-6, A-7	0-5	80-100	75-100	70-100	50-95	25-50	11-25
	40-48	Channery clay loam, channery silty clay loam, channery silty clay.	CL, GC	A-4, A-6, A-7	0-20	40-75	35-70	25-70	15-65	25-50	7-25
	48	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Cateache--------	0-3	Silt loam--------	CL, CL-ML	A-4, A-6	0-5	85-100	80-95	75-90	60-85	20-40	4-15
	3-20	Silt loam, channery silt loam, very channery silty clay loam.	CL-ML, CL, GC, GM-GC	A-2, A-4, A-6	0-15	40-85	35-80	30-80	25-70	20-40	4-15
	20-25	Very channery silty clay loam, extremely channery silt loam, extremely channery silty clay loam.	GM-GC, GC, GP, GP-GC, GM	A-2, A-4, A-6, A-1	0-20	20-60	10-50	10-45	10-40	20-40	4-15
	25	Weathered bedrock	---	---	---	---	---	---	---	---	---
BeC*, BeE*, BeF*, BeG*: Belmont--------	0-9	Stony silt loam	CL, ML, CL-ML	A-4, A-6	3-10	80-100	75-100	70-100	50-90	20-40	5-15
	9-17	Silty clay loam, silt loam, channery clay loam.	CL, ML, CL-ML	A-4, A-6, A-7	0-5	80-100	75-100	70-100	50-90	25-45	5-20
	17-40	Silty clay loam, channery clay loam, silty clay.	CL	A-6, A-7	0-5	80-100	75-100	70-100	50-95	25-50	11-25
	40-48	Channery clay loam, channery silty clay loam, channery silty clay loam.	CL, GC	A-4, A-6, A-7	0-20	40-75	35-70	25-70	15-65	25-50	7-25
	48	Unweathered bedrock.	---	---	---	---	---	---	---	---	---

See footnote at end of table.

TABLE 15.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
BeC*, BeE*, BeF*, BeG*:											
Cateache-------	0-3	Stony silt loam	CL, CL-ML	A-4, A-6	15-30	70-85	65-80	60-75	45-70	20-40	4-15
	3-20	Silt loam, channery silt loam, very channery silty clay loam.	CL-ML, CL, GC, GM-GC	A-2, A-4, A-6	0-15	40-85	35-80	30-80	25-70	20-40	4-15
	20-25	Very channery silty clay loam, extremely channery silt loam, extremely channery silty clay loam.	GM-GC, GC, GP-GC	A-2, A-4, A-6, A-1	0-20	20-60	10-50	10-45	10-40	20-40	4-15
	25	Weathered bedrock	---	---	---	---	---	---	---	---	---
BkC, BkD, BkE, BkF------------- Berks	0-5	Channery silt loam.	GM, ML, GC, SC	A-2, A-4	0-30	50-80	45-70	40-60	30-55	25-36	5-10
	5-23	Channery loam, extremely channery loam, channery silt loam.	GM, SM, GC, SC	A-1, A-2, A-4	0-30	40-80	35-70	25-60	20-45	25-36	5-10
	23-37	Extremely channery loam, very channery loam, extremely channery silt loam.	GM, SM	A-1, A-2	0-40	35-65	25-55	20-40	15-35	24-38	2-10
	37	Weathered bedrock	---	---	---	---	---	---	---	---	---
BmE, BmF, BmG---- Berks	0-5	Stony loam	GM, SM, GC, SC	A-2, A-4	15-30	40-80	35-70	30-60	25-45	25-36	5-10
	5-23	Channery loam, extremely channery loam, channery silt loam.	GM, GC, SM, SC	A-1, A-2, A-4	0-30	40-80	35-70	25-60	20-45	25-36	5-10
	23-37	Extremely channery loam, very channery loam, extremely channery silt loam.	GM, SM	A-1, A-2	0-40	35-65	25-55	20-40	15-35	24-38	2-10
	37	Weathered bedrock	---	---	---	---	---	---	---	---	---

See footnote at end of table.

TABLE 15.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
BnC*, BnD*, BnD3*, BnF*, BnF3*, BnG*, BnG3*:											
Berks----------	0-5	Channery silt loam.	GM, ML, GC, SC	A-2, A-4	0-30	50-80	45-70	40-60	30-55	25-36	5-10
	5-23	Channery loam, extremely channery loam, channery silt loam.	GM, SM, GC, SC	A-1, A-2, A-4	0-30	40-80	35-70	25-60	20-45	25-36	5-10
	23-37	Extremely channery loam, very channery loam, extremely channery silt loam.	GM, SM	A-1, A-2	0-40	35-65	25-55	20-40	15-35	24-38	2-10
	37	Weathered bedrock	---	---	---	---	---	---	---	---	---
Weikert--------	0-4	Channery silt loam.	GM, ML, SM	A-1, A-2, A-4	0-10	35-70	35-70	25-65	20-55	30-40	4-10
	4-16	Very channery loam, extremely channery silt loam, very channery silt loam.	GM, GP-GM	A-1, A-2	0-20	15-60	10-55	5-45	5-35	28-36	3-9
	16	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
BrC, BrD--------- Blackthorn	0-6	Channery sandy loam.	ML, CL-ML, SM, SM-SC	A-2, A-4, A-1	0-25	70-95	65-95	40-70	20-55	15-27	NP-7
	6-60	Channery sandy loam, very channery sandy loam, extremely channery loam.	GM, SM, SC, SM-SC	A-2, A-4, A-1	5-30	40-90	25-90	20-60	10-45	18-30	1-9
	60-72	Clay, silty clay, channery silty clay loam.	CL, CH	A-6, A-7	0-10	85-100	70-100	65-95	55-90	30-65	15-40
BsC, BsE, BsF---- Blackthorn	0-6	Stony sandy loam	ML, SM, CL-ML, SM-SC	A-2, A-4, A-1	3-15	65-90	60-85	35-70	15-55	15-27	NP-7
	6-60	Channery sandy loam, very channery sandy loam, extremely channery loam.	GM, SM, SC, SM-SC	A-2, A-4, A-1	5-30	40-90	25-90	20-60	10-45	18-30	1-9
	60-72	Clay, clay loam, channery silty clay loam.	CL, CH	A-6, A-7	0-10	85-100	70-100	65-95	55-90	30-65	15-40

See footnote at end of table.

TABLE 15.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
BtC*, BtE*:											
Blackthorn------	0-6	Stony sandy loam	ML, SM, CL-ML, SM-SC	A-2, A-4, A-1	3-15	65-90	60-85	35-70	15-55	15-27	NP-7
	6-60	Channery sandy loam, very channery sandy loam, extremely channery loam.	GM, SM, SC, SM-SC	A-2, A-4, A-1	5-30	40-90	25-90	20-60	10-45	18-30	1-9
	60-72	Clay, clay loam, channery silty clay loam.	CL, CH	A-6, A-7	0-10	85-100	70-100	65-95	55-90	30-65	15-40
Dekalb----------	0-3	Stony sandy loam	SM, GM, ML, CL-ML	A-2, A-4, A-1	10-30	50-90	45-80	40-75	20-55	10-32	NP-10
	3-27	Channery sandy loam, extremely channery loam, very channery sandy loam.	SM, GM, ML, GM-GC	A-2, A-4, A-1	5-40	50-85	40-75	40-75	20-55	15-32	NP-9
	27	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Elliber---------	0-4	Stony loam-------	GM, GP	A-2, A-1, A-4	3-15	30-60	20-60	15-50	10-40	---	---
	4-65	Very channery silt loam, very channery sandy loam, extremely channery loam.	GM, GP-GM, SP-SM	A-2, A-1, A-4	20-40	40-65	5-45	5-45	5-40	20-35	NP-7
BuB, BuC--------- Buchanan	0-3	Channery loam----	GM, ML, CL, CL-ML	A-4, A-2	0-10	50-100	45-75	40-75	30-65	20-35	2-11
	3-20	Loam, very channery clay loam, channery sandy clay loam.	GM, ML, CL, SM	A-4, A-2	0-20	50-100	45-90	40-90	20-80	20-35	2-15
	20-65	Channery loam, loam, channery clay loam, very channery loam.	GM, ML, CL, SM	A-4, A-2, A-6	0-20	50-100	30-80	30-75	20-60	20-35	2-15
CaC, CaD--------- Calvin	0-2	Channery silt loam.	ML, CL	A-4	0-15	70-95	70-90	65-90	55-75	---	---
	2-18	Channery silt loam, channery loam, very channery silty clay loam.	ML, SM, GM	A-2, A-4, A-6	0-15	70-95	55-90	40-90	30-75	22-38	NP-11
	18-24	Very channery silt loam, extremely channery silt loam, very channery loam.	GM, SM, SC, GC	A-2, A-1, A-4, A-6	0-20	35-75	30-65	15-60	15-40	23-39	3-13
	24	Unweathered bedrock.	---	---	---	---	---	---	---	---	---

See footnote at end of table.

TABLE 15.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
CdC*, CdE*, CdF*, CdG*:											
Calvin----------	0-2	Stony silt loam	ML, CL	A-4	3-15	70-100	70-100	65-95	55-90	---	---
	2-18	Channery silt loam, channery loam, very channery silty clay loam.	ML, SM, GM	A-2, A-4, A-6	0-15	70-95	55-90	40-90	30-75	22-38	NP-11
	18-24	Very channery silt loam, extremely channery silt loam, very channery loam.	GM, SM, GM-GC, SM-SC	A-2, A-1, A-6	0-20	35-75	30-65	15-60	15-40	23-39	3-11
	24	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Dekalb----------	0-3	Stony sandy loam	SM, GM, ML, CL-ML	A-2, A-4, A-1	10-30	50-90	45-80	40-75	20-55	10-32	NP-10
	3-27	Channery sandy loam, extremely channery loam, very channery sandy loam.	SM, GM, ML, GM-GC	A-2, A-4, A-1	5-40	50-85	40-75	40-75	20-55	15-32	NP-9
	27	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Hazleton--------	0-5	Stony sandy loam	ML, GM, SM	A-4, A-2	5-25	60-85	50-80	50-70	35-55	---	---
	5-35	Very channery sandy loam, channery loam, extremely channery loam.	GM, SM, ML, SC	A-2, A-4, A-1	0-50	60-95	45-90	35-70	20-55	<30	NP-8
	35-65	Very channery loam, very channery sandy loam, extremely channery loamy sand.	GM, SM, SC, GC	A-2, A-1, A-4	5-60	50-80	35-75	25-65	15-50	<30	NP-8
CeC-------------- Cateache	0-3	Silt loam--------	CL, CL-ML	A-4, A-6	0-5	85-100	80-95	75-90	60-85	20-40	4-15
	3-20	Silt loam, very channery silty clay loam, channery silt loam.	CL-ML, CL, GC, GM-GC	A-2, A-4, A-6	0-15	40-85	35-80	30-80	25-70	20-40	4-15
	20-25	Very channery silty clay loam, extremely channery silt loam, extremely channery silty clay loam.	GM-GC, GC, GP, GP-GC	A-2, A-4, A-6, A-1	0-20	20-60	10-50	10-45	10-40	20-40	4-15
	25	Weathered bedrock	---	---	---	---	---	---	---	---	---

See footnote at end of table.

TABLE 15.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
CfC, CfE, CfF, CfG------------- Cateache	0-3	Stony silt loam	CL, CL-ML	A-4, A-6	15-30	70-85	65-80	60-75	45-70	20-40	4-15
	3-20	Silt loam, very channery silty clay loam, channery silt loam.	CL-ML, CL, GC, GM-GC	A-2, A-4, A-6	0-15	40-85	35-80	30-80	25-70	20-40	4-15
	20-25	Very channery silty clay loam, extremely channery silt loam, extremely channery silty clay loam.	GM-GC, GC, GP-GC	A-2, A-4, A-6, A-1	0-20	20-60	10-50	10-45	10-40	20-40	4-15
	25	Weathered bedrock	---	---	---	---	---	---	---	---	---
Ch--------------- Chagrin	0-12	Loam-------------	ML, CL, CL-ML	A-4	0	95-100	85-100	80-100	70-90	20-35	2-10
	12-26	Silt loam, loam, fine sandy loam.	ML, SM	A-4, A-2, A-6	0	90-100	75-100	55-90	30-80	20-40	NP-14
	26-65	Stratified silt loam to very gravelly fine sand.	ML, SM, SP-SM, GM	A-4, A-2	0	75-100	65-100	40-85	10-80	20-40	NP-10
CkB, CkC--------- Clarksburg	0-6	Channery silt loam.	ML, CL	A-4, A-6	0-15	80-100	65-95	60-80	55-75	25-35	2-11
	6-23	Loam, channery silty clay loam, channery silt loam.	ML, CL, CL-ML	A-4, A-6, A-7	0-10	80-100	65-100	60-95	55-85	25-45	6-20
	23-43	Channery silty clay loam, loam, channery silt loam.	CL-ML, CL, SM-SC, SC	A-4, A-6, A-7	0-15	75-100	55-100	50-95	45-90	20-45	4-20
	43-65	Clay, channery loam, very channery silty clay loam.	CL, CH, SM-SC, GC	A-4, A-6, A-7, A-2	0-20	50-100	20-100	15-95	15-90	20-52	4-25
ClC, ClD--------- Clarksburg	0-6	Stony silt loam	ML, CL	A-4	3-15	70-95	65-85	60-80	55-75	25-35	2-11
	6-23	Loam, channery silty clay loam, channery silt loam.	ML, CL, CL-ML	A-4, A-6, A-7	0-10	80-100	65-100	60-95	55-85	25-45	6-20
	23-43	Channery silty clay loam, loam, channery silt loam.	ML, CL, SM-SC, SC	A-4, A-6, A-7	0-15	75-100	55-100	50-95	45-90	20-45	4-20
	43-65	Channery loam, very channery silty clay loam, silt loam.	CL, CL-ML, SM-SC, GC	A-4, A-6, A-7	0-20	50-100	20-100	15-95	15-90	20-50	4-25

See footnote at end of table.

TABLE 15.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
DeF*:											
Dekalb----------	0-3	Stony sandy loam	SM, GM, ML, CL-ML	A-2, A-4, A-1	10-30	50-90	45-80	40-75	20-55	10-32	NP-10
	3-27	Channery sandy loam, extremely channery loam, very channery sandy loam.	SM, GM, ML, GM-GC	A-2, A-4, A-1	5-40	50-85	40-75	40-75	20-55	15-32	NP-9
	27	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Elliber---------	0-4	Stony loam-------	GM, GP	A-2, A-1, A-4	3-15	30-60	20-60	15-50	10-40	---	---
	4-65	Very channery silt loam, very channery sandy loam, extremely channery loam.	GM, GP-GM, SP-SM	A-2, A-1, A-4	20-40	40-65	5-45	5-45	5-40	20-35	NP-7
Blackthorn------	0-6	Stony sandy loam	ML, SM, CL-ML, SM-SC	A-2, A-4, A-1	3-15	65-90	60-85	35-70	15-55	15-27	NP-7
	6-60	Channery sandy loam, very channery sandy loam, extremely channery loam.	GM, SM, SC, SM-SC	A-2, A-4, A-1	5-30	40-90	25-90	20-60	10-45	18-30	1-9
	60-72	Clay, clay loam, channery silty clay loam.	CL, CH	A-6, A-7	0-10	85-100	70-100	65-95	55-90	30-65	15-40
DfG*:											
Dekalb----------	0-3	Stony sandy loam	SM, GM, ML, CL-ML	A-2, A-4, A-1	10-30	50-90	45-80	40-75	20-55	10-32	NP-10
	3-27	Channery sandy loam, extremely channery loam, very channery sandy loam.	SM, GM, ML, GM-GC	A-2, A-4, A-1	5-40	50-85	40-75	40-75	20-55	15-32	NP-9
	27	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Elliber---------	0-4	Stony loam-------	GM, GP	A-2, A-1, A-4	3-15	30-60	20-60	15-50	10-40	---	---
	4-65	Very channery silt loam, very channery sandy loam, extremely channery loam.	GM, GP-GM, SP-SM	A-2, A-1, A-4	20-40	40-65	5-45	5-45	5-40	20-35	NP-7
Du--------------- Dunning	0-8	Silt loam--------	ML, CL, CL-ML	A-6, A-4	0	100	95-100	90-100	85-100	25-35	4-11
	8-65	Silty clay, clay, gravelly silty clay loam.	CH, CL	A-7	0-5	90-100	70-100	60-100	60-100	45-70	20-40

See footnote at end of table.

TABLE 15.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
EdC, EdD, EdE, EdF------------- Edom	0-6	Channery silt loam.	ML, CL	A-4, A-6	0-5	80-95	65-80	60-75	55-70	---	---
	6-30	Channery silty clay, channery clay, silty clay loam.	CH, CL	A-7, A-6	0-10	70-90	65-85	65-85	55-80	35-55	12-30
	30-42	Channery silty clay loam, channery silty clay, extremely channery clay.	GM, ML, SM	A-7, A-6, A-2	5-20	25-80	20-70	15-60	15-55	35-49	10-20
	42	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
ElC, ElD, ElE, ElF------------- Elliber	0-4	Extremely channery loam.	GM, GP	A-2, A-1, A-4	5-15	30-60	20-55	15-45	10-40	---	---
	4-65	Very channery silt loam, very channery sandy loam, extremely channery loam.	GM, SP-SM, SM, GP-GM	A-2, A-1, A-4	20-40	40-65	30-60	25-50	5-40	20-35	NP-7
ErB, ErC, ErD---- Ernest	0-7	Silt loam--------	ML, CL, CL-ML	A-4, A-6	0-10	85-100	80-100	70-95	60-95	20-40	4-15
	7-24	Silty clay loam, silt loam, channery silt loam.	ML, CL, CL-ML	A-4, A-6, A-7	0-15	75-95	70-100	65-90	55-90	25-50	6-22
	24-45	Silt loam, channery loam, silty clay loam.	ML, CL, GM, SC	A-4, A-6, A-7	0-20	70-95	55-95	55-90	45-90	20-45	4-18
	45-65	Channery silt loam, very channery silt loam, silty clay loam.	ML, CL, GM, SC	A-4, A-6, A-7	0-20	70-95	45-95	45-90	40-90	25-50	6-22
GaC, GaE, GaF, GaG------------- Gauley	0-6	Rubbly loam------	ML, CL-ML, SM, GM	A-1, A-2, A-4	50-85	40-80	40-75	35-70	20-55	15-25	NP-7
	6-18	Channery loam, very channery loam, very channery sandy loam.	ML, CL-ML, SM, GM	A-1, A-2, A-4	10-40	40-80	40-80	40-75	20-55	15-25	NP-7
	18-30	Extremely channery loam, very channery sandy loam, channery loamy sand.	SM-SC, GM-GC, SM, GM	A-1, A-2, A-4	10-50	45-75	30-75	25-70	20-50	15-25	NP-7
	30	Unweathered bedrock.	---	---	---	---	---	---	---	---	---

See footnote at end of table.

TABLE 15.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
HdC*, HdE*, HdF*, HdG*:											
Hazleton-------	0-5	Stony sandy loam	ML, GM, SM	A-4, A-2	5-25	60-85	50-80	50-70	35-55	---	---
	5-35	Very channery sandy loam, channery loam, extremely channery loam.	GM, SM, ML, SC	A-2, A-4, A-1	0-50	60-95	45-90	35-70	20-55	<30	NP-8
	35-65	Very channery loam, very channery sandy loam, extremely channery loamy sand.	GM, SM, SC, GC	A-2, A-1, A-4	5-60	50-80	35-75	25-65	15-50	<30	NP-8
Dekalb---------	0-3	Stony sandy loam	SM, GM, ML, CL-ML	A-2, A-4, A-1	10-30	50-90	45-80	40-75	20-55	10-32	NP-10
	3-27	Channery sandy loam, extremely channery loam, very channery sandy loam.	SM, GM, ML, GM-GC	A-2, A-4, A-1	5-40	50-85	40-75	40-75	20-55	15-32	NP-9
	27	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
LaC, LaD--------- Laidig	0-6	Channery loam----	GM, SM, ML, CL	A-4	0-5	65-90	50-80	45-80	35-70	15-30	1-10
	6-34	Channery loam, very channery sandy clay loam, channery sandy loam.	SM, SC, CL, ML	A-2, A-4, A-6	5-20	70-95	50-90	40-80	20-70	15-40	2-18
	34-65	Channery sandy clay loam, very channery loam, channery sandy loam.	GC, SC, GM-GC, CL-ML	A-2, A-4, A-6	5-20	50-90	40-85	30-80	15-70	15-35	2-16
LdE------------- Laidig	0-6	Stony loam-------	GM-GC, SM, CL-ML, SM-SC	A-4	3-15	65-90	50-80	45-80	35-70	15-30	NP-10
	6-34	Channery loam, very channery sandy clay loam, channery sandy loam.	SM, SC, ML, CL	A-2, A-4, A-6	5-20	70-95	50-90	40-80	20-70	15-40	2-18
	34-65	Channery sandy clay loam, very channery loam, channery sandy loam.	SC, GM-GC, CL-ML, GC	A-2, A-4, A-6	5-20	50-90	40-85	30-80	15-70	15-35	2-16

See footnote at end of table.

TABLE 15.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
LeF-------------- Laidig	0-6	Very stony loam	GM-GC, CL-ML, SM-SC, SM	A-4	15-30	65-90	50-80	45-80	35-70	15-30	NP-10
	6-34	Channery loam, very channery sandy clay loam, channery sandy loam.	SM, SC, CL, ML	A-2, A-4, A-6	5-20	70-95	50-90	40-80	20-70	15-40	2-18
	34-65	Channery sandy clay loam, very channery loam, channery sandy loam.	GC, GM-GC, CL-ML, SC	A-2, A-4, A-6	5-20	50-90	40-85	30-80	15-70	15-35	2-16
LgC*:											
Laidig----------	0-6	Stony loam-------	GM-GC, SM, CL-ML, SM-SC	A-4	3-15	65-90	50-80	45-80	35-70	15-30	NP-10
	6-34	Channery loam, very channery sandy clay loam, channery sandy loam.	SM, SC, ML, CL	A-2, A-4, A-6	5-20	70-95	50-90	40-80	20-70	15-40	2-18
	34-65	Channery sandy clay loam, very channery loam, channery sandy loam.	SC, GM-GC, CL-ML, GC	A-2, A-4, A-6	5-20	50-90	40-85	30-80	15-70	15-35	2-16
Buchanan--------	0-3	Stony loam-------	GM, ML, CL, CL-ML	A-2, A-4	3-20	50-90	45-75	40-75	30-65	20-35	2-11
	3-20	Loam, very channery clay loam, channery sandy clay loam.	GM, ML, CL, SM	A-2, A-4	0-20	50-100	45-90	40-90	20-80	20-35	2-15
	20-65	Channery loam, loam, channery clay loam, very channery loam.	GM, ML, CL, SM	A-2, A-4, A-6	0-20	50-100	30-80	30-75	20-60	20-35	2-15

See footnote at end of table.

TABLE 15.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
LhC*, LhD*:											
Lehew-----------	0-3	Channery fine sandy loam.	GM, ML, CL-ML, SM	A-2, A-4	5-30	50-80	45-70	40-65	25-60	15-30	NP-7
	3-30	Very channery sandy loam, very channery fine sandy loam, channery loam.	SM, GM, GM-GC, SM-SC	A-2, A-4	5-40	45-75	30-65	20-55	10-40	15-30	NP-7
	30-36	Very channery sandy loam, very channery fine sandy loam, extremely channery loam.	SM, GM, GM-GC, SM-SC	A-2, A-4	10-50	45-75	30-65	20-55	10-40	15-30	NP-7
	36	Weathered bedrock	---	---	---	---	---	---	---	---	---
Dekalb----------	0-3	Very channery sandy loam.	SM, GM, ML, CL-ML	A-2, A-4, A-1	0-30	50-90	45-80	40-75	20-55	10-32	NP-10
	3-27	Channery sandy loam, extremely channery loam, very channery sandy loam.	SM, GM, ML, GM-GC	A-2, A-4, A-1	5-40	50-85	40-80	40-75	20-55	15-32	NP-9
	27	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
LkC*, LkE*, LkF*, LkG*:											
Lehew----------	0-3	Stony fine sandy loam.	SM, GM, ML, CL-ML	A-2, A-4	5-25	50-90	45-80	40-75	20-55	15-30	NP-7
	3-30	Very channery sandy loam, very channery fine sandy loam, channery loam.	SM, GM, GM-GC, SM-SC	A-2, A-4	5-40	45-75	30-65	20-55	10-40	15-30	NP-7
	30-36	Very channery sandy loam, very channery fine sandy loam, extremely channery loam.	SM, GM, GM-GC, SM-SC	A-2, A-4	10-50	45-75	30-65	20-55	10-40	15-30	NP-7
	36	Weathered bedrock	---	---	---	---	---	---	---	---	---
Hazleton-------	0-5	Stony sandy loam	ML, GM, SM	A-4, A-2	5-25	60-85	50-80	50-70	35-55	---	---
	5-35	Very channery sandy loam, channery loam, extremely channery loam.	GM, SM, ML, SC	A-2, A-4, A-1	0-50	60-95	45-90	35-70	20-55	<30	NP-8
	35-65	Very channery loam, very channery sandy loam, extremely channery loamy sand.	GM, SM, SC, GC	A-2, A-1, A-4	5-60	50-80	35-75	25-65	15-50	<30	NP-8

See footnote at end of table.

TABLE 15.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
LkC*, LkE*, LkF*, LkG*: Dekalb	0-3	Stony sandy loam	SM, GM, ML, CL-ML	A-2, A-4, A-1	10-30	50-90	45-80	40-75	20-55	10-32	NP-10
	3-27	Channery sandy loam, extremely channery loam, very channery sandy loam.	SM, GM, ML, GM-GC	A-2, A-4, A-1	5-40	50-85	40-75	40-75	20-55	15-32	NP-9
	27	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
LmF*: Lithic Udorthents.											
Rock outcrop.											
Lo Lobdell	0-15	Loam	ML, CL-ML, CL	A-4	0	95-100	90-100	80-100	65-90	20-30	NP-8
	15-33	Loam, silt loam, silty clay loam.	ML	A-4	0	90-100	80-100	70-95	55-85	20-35	NP-10
	33-65	Stratified sandy loam to silt loam.	ML, SM, CL-ML, CL	A-4	0	90-100	80-100	65-85	40-80	15-35	NP-10
MaC, MaD Mandy	0-2	Channery silt loam.	CL-ML, CL	A-4	0-15	65-80	60-75	55-70	50-65	20-32	4-10
	2-22	Channery silt loam, very channery silt loam, extremely channery loam.	GM, GC, SM-SC	A-1, A-2, A-4	0-30	40-80	35-70	25-60	20-45	20-32	4-10
	22-25	Extremely channery silt loam, extremely channery loam.	GM, GC, SM-SC	A-1, A-2	0-40	35-65	25-55	20-40	15-35	20-32	4-10
	25	Weathered bedrock	---	---	---	---	---	---	---	---	---
MdE, MdF Mandy	0-2	Stony silt loam	CL-ML, CL	A-4	3-15	65-80	60-75	55-70	50-65	20-32	4-10
	2-22	Channery silt loam, very channery silt loam, extremely channery loam.	GM, GC, SM, SC	A-1, A-2, A-4	0-30	40-80	35-70	25-60	20-45	20-32	4-10
	22-25	Extremely channery silt loam, extremely channery loam.	GM, GC, SM, SC	A-1, A-2	0-40	35-65	25-55	20-40	15-35	20-32	4-10
	25	Weathered bedrock	---	---	---	---	---	---	---	---	---
Mn Massanetta	0-10	Silt loam	ML, CL, CL-ML	A-4, A-6	0-5	90-100	85-100	75-95	55-80	12-30	2-12
	10-31	Clay loam, silty clay loam, silt loam, loam.	CL	A-6	0-5	90-100	85-100	75-95	55-85	25-40	10-20
	31-65	Loam, silty clay loam, gravelly clay loam.	CL, CL-ML, SM-SC, SC	A-4, A-6	0-10	75-100	60-100	50-95	40-90	20-40	5-20

See footnote at end of table.

TABLE 15.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
MoB, MoC--------- Monongahela	0-7	Silt loam--------	ML, SM, CL-ML, SM-SC	A-4	0-5	90-100	85-100	75-100	45-90	20-35	1-10
	7-26	Silt loam, gravelly loam, silty clay loam.	ML, CL, CL-ML	A-4, A-6	0-15	90-100	80-100	75-100	70-90	20-40	5-15
	26-48	Silt loam, sandy clay loam, cobbly silt loam.	ML, CL, SM, SC	A-4, A-6	0-10	80-100	60-100	55-95	45-95	20-40	3-15
	48-65	Silt loam, cobbly loam, silty clay loam.	ML, CL, SM, SC	A-4, A-6	10-20	75-100	60-90	60-85	40-85	20-40	1-15
OeC, OeE, OeF, OeG------------- Opequon	0-3	Very rocky silt loam.	ML, CL	A-4, A-6	0-5	85-100	80-100	75-100	60-90	25-35	5-15
	3-14	Silty clay loam, clay, channery silty clay.	CH, MH, CL	A-6, A-7	0-10	80-100	60-100	60-100	55-95	35-65	15-40
	14	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
OnC3*, OnD3*, OnE3*, OnF3*: Opequon--------	0-3	Silty clay loam	CL, MH, CH	A-6, A-7	0-5	85-100	80-100	80-100	75-95	30-55	10-30
	3-14	Silty clay loam, clay, channery silty clay.	CH, MH, CL	A-6, A-7	0-10	80-100	60-100	60-100	55-95	35-65	15-40
	14	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Caneyville-----	0-3	Silty clay loam	CL	A-7, A-6	0-3	90-100	85-100	75-100	65-100	35-50	20-35
	3-23	Silty clay, clay, silty clay loam.	CH, CL	A-7	0-3	90-100	85-100	75-100	65-100	42-70	20-45
	23-34	Channery clay, extremely channery silty clay.	CH, GC	A-7	0-20	45-90	35-70	30-60	25-55	40-65	30-45
	34	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Or--------------- Orrville	0-10	Loam------------	ML, CL-ML, CL	A-4	0	100	90-100	85-100	60-80	20-35	3-10
	10-41	Silt loam, loam, silty clay loam.	CL, CL-ML, ML	A-4, A-6	0-2	95-100	75-100	70-95	50-90	20-40	2-16
	41-65	Stratified gravelly sandy loam to silty clay loam.	ML, CL, SM, SC	A-4, A-2, A-1	0-2	95-100	65-100	40-85	15-75	15-35	NP-10
Po--------------- Potomac	0-8	Fine sandy loam	SM, ML, SM-SC, CL-ML	A-2, A-4	0-10	85-100	80-100	50-85	30-60	<20	NP-5
	8-68	Very cobbly loamy sand, very gravelly loamy sand, extremely gravelly sand, sand.	SM, GM, SW-SM, GW-GM	A-1, A-2	15-50	50-80	35-80	20-50	5-25	<15	NP-3

See footnote at end of table.

TABLE 15.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag- ments > 3 inches	Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
Pt--------------- Potomac	0-8	Very cobbly fine sandy loam.	SM, GM, SM-SC, GM-GC	A-1, A-2, A-4	15-40	60-90	50-85	30-75	20-55	<20	NP-5
	8-68	Very cobbly loamy sand, very gravelly loamy sand, extremely gravelly sand, sand.	SM, GM, SW-SM, GW-GM	A-1, A-2	15-50	50-80	35-80	20-50	5-25	<15	NP-3
Pu--------------- Purdy	0-11	Silt loam--------	ML, CL	A-4, A-6, A-7	0	95-100	90-100	90-100	90-100	25-50	4-20
	11-36	Silty clay, clay, clay loam.	CL, CH, MH	A-6, A-7	0	95-100	90-100	85-100	75-85	30-65	11-30
	36-65	Silty clay, clay loam, clay.	CL, CH, MH	A-6, A-7	0	95-100	90-100	85-100	70-95	30-65	11-30
Qu*. Quarry											
Ro*: Rock outcrop.											
Rubble land.											
RuF-------------- Rushtown	0-7	Channery silt loam.	GM, ML, SM	A-2, A-4, A-1	0	40-75	35-70	30-70	20-65	25-40	1-10
	7-34	Channery silt loam, very channery silt loam.	GM	A-1, A-2, A-4	0	30-60	25-55	25-55	20-50	25-40	1-10
	34-65	Extremely channery silt loam.	GM, GP	A-1, A-2	0	10-35	5-30	5-30	3-25	25-40	1-10
ShC, ShE--------- Shouns	0-5	Stony loam-------	ML, CL, CL-ML	A-4, A-6	5-15	80-100	75-100	65-95	55-90	15-30	3-12
	5-45	Silty clay loam, clay loam, channery loam.	CL, CL-ML	A-4, A-6	0-15	80-100	75-100	70-95	60-90	25-40	8-17
	45-65	Silty clay loam, clay loam, channery silt loam.	CL, ML	A-4, A-6, A-7	10-25	75-100	65-90	60-85	50-75	30-45	10-20
SnC, SnE, SnF---- Shouns	0-5	Very stony loam	ML, CL, CL-ML	A-4, A-6	15-30	80-100	75-100	65-95	55-90	15-30	3-12
	5-45	Silty clay loam, clay loam, channery loam.	CL, CL-ML	A-4, A-6	0-15	80-100	75-100	70-95	60-90	25-40	8-17
	45-65	Silty clay loam, clay loam, channery silt loam.	CL, ML	A-4, A-6, A-7	10-25	75-100	65-90	60-85	50-75	30-45	10-20

See footnote at end of table.

TABLE 15.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag- ments > 3 inches	Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
SoC, SoE, SoF---- Shouns	0-5	Rubbly loam------	ML, CL-ML, CL, SM	A-4, A-6	50-85	75-80	65-75	55-70	45-60	20-30	3-9
	5-45	Channery loam, channery clay loam, channery silt loam.	ML, CL, GM	A-4, A-6	10-35	70-80	65-75	55-70	50-65	25-40	7-14
	45-65	Channery loam, channery clay loam, channery silt loam.	ML, CL, GM	A-4, A-6	10-45	55-80	50-75	45-70	35-65	25-40	7-14
SrB-------------- Simoda	0-5	Extremely stony loam.	CL, CL-ML, GC, GM-GC	A-4	25-60	55-75	50-70	45-65	35-60	20-30	5-10
	5-26	Loam, channery loam, silty clay loam.	ML, CL, GC, SC	A-4, A-6	0-20	70-100	65-100	60-95	45-90	25-40	7-14
	26-40	Channery sandy loam, channery silt loam, silty clay loam.	ML, CL, GC, SC	A-4, A-6	0-20	65-100	60-95	55-90	35-85	25-40	7-14
	40-65	Loam, very channery sandy loam, channery silty clay loam.	ML, CL, GC, SC	A-4, A-6	0-30	55-100	50-95	45-90	35-85	25-40	7-14
	65	Weathered bedrock	---	---	---	---	---	---	---	---	---
Tg--------------- Tioga	0-8	Loam------------	ML, SM	A-4	0	100	95-100	65-95	40-85	<15	NP-4
	8-44	Gravelly silt loam, loam, sandy loam.	SM, GM, ML	A-1, A-2, A-4	0	70-100	65-100	35-90	20-80	<15	NP-2
	44-65	Loam, gravelly loam, very gravelly loamy sand.	GW-GM, GM, SM, ML	A-1, A-2, A-4, A-3	0-10	35-100	30-100	15-90	5-80	<15	NP-2
ToB-------------- Toms	0-5	Silt loam--------	ML, CL-ML	A-4	0-1	90-100	85-100	80-90	55-80	<25	NP-7
	5-13	Silt loam, loam, silty clay loam.	ML, CL-ML	A-4	0-1	90-100	85-100	80-95	60-85	<25	NP-7
	13-30	Clay, silty clay, channery silty clay.	CL, CH	A-7	0-10	85-100	85-100	80-90	75-90	40-75	15-45
	30-46	Silty clay, channery silty clay loam, very channery clay.	CL, CH	A-7	0-10	90-100	90-100	85-100	75-95	40-75	15-45
	46-65	Very channery silty clay loam, clay loam, silty clay.	CL, CH	A-7	0-20	80-100	80-100	75-90	70-90	40-75	15-45

See footnote at end of table.

TABLE 15.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
TrC-------------- Trussel	0-2	Channery loam----	CL-ML, CL, SC	A-4	0-10	75-100	70-100	60-95	45-90	20-30	5-10
	2-12	Channery silt loam, loam, channery silty clay loam.	CL, ML, SC	A-4, A-6	0-10	75-100	70-100	60-100	45-95	25-40	7-14
	12-21	Channery silt loam, very channery loam, channery loam.	CL, ML, SC, GC	A-2, A-4, A-6	0-30	45-90	40-85	35-80	25-75	25-35	7-14
	21-65	Channery silt loam, very channery loam, channery loam.	CL, ML, SC, GC	A-2, A-4, A-6	0-30	45-90	40-85	35-80	25-75	25-35	7-14
TsC-------------- Trussel	0-2	Extremely stony loam.	CL-ML, CL, SC	A-4	25-60	65-95	60-90	55-85	40-80	20-30	5-10
	2-12	Channery silt loam, loam, channery silty clay loam.	CL, ML, SC	A-4, A-6	0-10	75-100	70-100	60-100	45-95	25-40	7-14
	12-21	Channery silt loam, very channery loam, channery loam.	CL, ML, SC, GC	A-2, A-4, A-6	0-30	45-90	40-85	35-80	25-75	25-35	7-14
	21-65	Channery silt loam, very channery loam, channery loam.	CL, ML, SC, GC	A-2, A-4, A-6	0-30	45-90	40-85	35-80	25-75	25-35	7-14
TyB-------------- Tygart	0-9	Silt loam--------	ML, CL	A-4, A-6	0	95-100	95-100	85-100	60-90	25-40	2-15
	9-39	Silty clay loam, silty clay, clay.	CL, CH, MH	A-6, A-7	0	95-100	95-100	85-100	65-95	30-65	11-30
	39-55	Silty clay loam, silty clay, clay.	CL, CH, MH	A-6, A-7	0	95-100	95-100	85-100	70-95	30-65	11-30
	55-65	Gravelly silty clay, silty clay loam, clay.	CL, CH, MH	A-6, A-7	0-5	95-100	95-100	85-100	70-95	30-65	11-30
Ud. Udorthents											

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 16.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS

(The symbol < means less than; > means more than. Entries under "Erosion factors--T" apply to the entire profile. Entries under "Organic matter" apply only to the surface layer. Absence of an entry indicates that data were not available or were not estimated)

Soil name and map symbol	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors		Organic matter
								K	T	
	In	Pct	g/cc	In/hr	In/in	pH				Pct
AgB, AgC---------	0-8	15-27	1.20-1.40	0.6-2.0	0.12-0.22	4.5-5.5	Low----------	0.32	4	1-4
Allegheny	8-65	18-35	1.20-1.50	0.6-2.0	0.13-0.18	4.5-5.5	Low----------	0.28		
BcC*, BcD*:										
Belmont---------	0-9	18-27	1.20-1.40	0.6-6.0	0.16-0.20	5.1-6.5	Low----------	0.32	3	2-4
	9-17	23-35	1.30-1.50	0.6-2.0	0.14-0.18	5.1-6.5	Moderate-----	0.32		
	17-40	27-40	1.30-1.50	0.6-2.0	0.14-0.18	5.6-7.3	Moderate-----	0.32		
	40-48	20-60	1.30-1.50	0.6-2.0	0.12-0.16	5.6-7.8	Moderate-----	0.28		
	48	---	---	---	---	---	-------------	----		
Cateache--------	0-3	15-27	1.20-1.40	0.6-2.0	0.16-0.20	4.5-6.0	Low----------	0.32	3	1-4
	3-20	18-35	1.30-1.60	0.6-2.0	0.12-0.16	4.5-6.0	Moderate-----	0.28		
	20-25	15-35	1.30-1.60	0.6-2.0	0.08-0.12	5.1-6.0	Low----------	0.28		
	25	---	---	---	---	---	-------------	----		
BeC*, BeE*, BeF*, BeG*:										
Belmont--------	0-9	18-27	1.20-1.40	0.6-6.0	0.16-0.20	5.1-6.5	Low----------	0.32	3	2-4
	9-17	23-35	1.30-1.50	0.6-2.0	0.14-0.18	5.1-6.5	Moderate-----	0.32		
	17-40	27-40	1.30-1.50	0.6-2.0	0.14-0.18	5.6-7.3	Moderate-----	0.32		
	40-48	20-40	1.30-1.50	0.6-2.0	0.12-0.16	5.6-7.8	Moderate-----	0.28		
	48	---	---	---	---	---	-------------	----		
Cateache-------	0-3	15-27	1.20-1.40	0.6-2.0	0.14-0.18	4.5-6.0	Low----------	0.28	3	1-4
	3-20	18-35	1.30-1.60	0.6-2.0	0.12-0.16	4.5-6.0	Moderate-----	0.28		
	20-25	15-35	1.30-1.60	0.6-2.0	0.08-0.12	5.1-6.0	Low----------	0.28		
	25	---	---	---	---	---	-------------	----		
BkC, BkD, BkE, BkF-------------	0-5	5-23	1.20-1.50	0.6-6.0	0.08-0.12	4.5-5.5	Low----------	0.17	3	.5-3
Berks	5-23	5-32	1.20-1.60	0.6-6.0	0.04-0.10	4.5-5.5	Low----------	0.17		
	23-37	5-20	1.20-1.60	2.0-6.0	0.04-0.10	4.5-5.5	Low----------	0.17		
	37	---	---	---	---	---	-------------	----		
BmE, BmF, BmG----	0-5	5-23	1.20-1.50	0.6-6.0	0.08-0.12	4.5-5.5	Low----------	0.17	3	.5-3
Berks	5-23	5-32	1.20-1.60	0.6-6.0	0.04-0.10	4.5-5.5	Low----------	0.17		
	23-37	5-20	1.20-1.60	2.0-6.0	0.04-0.10	4.5-5.5	Low----------	0.17		
	37	---	---	---	---	---	-------------	----		
BnC*, BnD*, BnD3*, BnF*, BnF3*, BnG*, BnG3*:										
Berks----------	0-5	5-23	1.20-1.50	0.6-6.0	0.08-0.12	4.5-5.5	Low----------	0.17	3	.5-3
	5-23	5-32	1.20-1.60	0.6-6.0	0.04-0.10	4.5-5.5	Low----------	0.17		
	23-37	5-20	1.20-1.60	2.0-6.0	0.04-0.10	4.5-5.5	Low----------	0.17		
	37	---	---	---	---	---	-------------	----		
Weikert--------	0-4	15-27	1.20-1.40	2.0-6.0	0.08-0.14	4.5-5.5	Low----------	0.28	2	.5-3
	4-16	15-27	1.20-1.40	2.0-6.0	0.04-0.08	4.5-5.5	Low----------	0.28		
	16	---	---	---	---	---	-------------	----		
BrC, BrD---------	0-6	2-10	1.20-1.40	0.6-6.0	0.09-0.13	4.5-6.0	Low----------	0.20	4	2-5
Blackthorn	6-60	7-18	1.20-1.50	0.6-6.0	0.08-0.12	4.5-6.0	Low----------	0.20		
	60-72	27-60	1.30-1.60	0.2-2.0	0.14-0.18	4.5-5.5	Moderate-----	0.28		

See footnote at end of table.

TABLE 16.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS--Continued

Soil name and map symbol	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors K	Erosion factors T	Organic matter
	In	Pct	g/cc	In/hr	In/in	pH				Pct
BsC, BsE, BsF---- Blackthorn	0-6	2-10	1.20-1.40	0.6-6.0	0.10-0.15	4.5-6.0	Low----------	0.20	4	2-5
	6-60	7-18	1.20-1.50	0.6-6.0	0.08-0.12	4.5-6.0	Low----------	0.20		
	60-72	27-60	1.30-1.60	0.2-2.0	0.14-0.18	4.5-5.5	Moderate-----	0.28		
BtC*, BtE*:										
Blackthorn------	0-6	2-10	1.20-1.40	0.6-6.0	0.10-0.15	4.5-6.0	Low----------	0.20	4	2-5
	6-60	7-18	1.20-1.50	0.6-6.0	0.08-0.12	4.5-6.0	Low----------	0.20		
	60-72	27-60	1.30-1.60	0.2-2.0	0.14-0.18	4.5-5.5	Moderate-----	0.28		
Dekalb----------	0-3	10-20	1.20-1.50	2.0-20	0.08-0.12	3.6-5.5	Low----------	0.17	2	2-4
	3-27	7-18	1.20-1.50	2.0-20	0.06-0.12	3.6-5.5	Low----------	0.17		
	27	---	---	---	---	---	-------------	----		
Elliber---------	0-4	10-20	1.20-1.40	2.0-20	0.06-0.14	3.6-5.5	Low----------	0.17	3	1-3
	4-65	12-27	1.40-1.60	2.0-20	0.08-0.12	3.6-5.5	Low----------	0.17		
BuB, BuC--------- Buchanan	0-3	10-27	1.20-1.40	0.6-2.0	0.12-0.18	3.6-5.5	Low----------	0.24	3-2	1-3
	3-20	18-30	1.30-1.60	0.6-2.0	0.10-0.16	3.6-5.5	Low----------	0.24		
	20-65	18-35	1.40-1.70	0.06-0.2	0.06-0.10	3.6-5.5	Low----------	0.17		
CaC, CaD--------- Calvin	0-2	10-25	1.20-1.40	2.0-6.0	0.10-0.16	4.5-5.5	Low----------	0.20	3-2	.5-2
	2-18	15-30	1.40-1.60	2.0-6.0	0.08-0.16	4.5-5.5	Low----------	0.20		
	18-24	15-30	1.40-1.60	2.0-6.0	0.06-0.10	4.5-5.5	Low----------	0.20		
	24	---	---	---	---	---	-------------	----		
CdC*, CdE*, CdF*, CdG*:										
Calvin---------	0-2	10-25	1.20-1.40	2.0-6.0	0.10-0.16	4.5-5.5	Low----------	0.15	3-2	.5-2
	2-18	15-30	1.40-1.60	2.0-6.0	0.08-0.16	4.5-5.5	Low----------	0.20		
	18-24	15-30	1.40-1.60	2.0-6.0	0.06-0.10	4.5-5.5	Low----------	0.20		
	24	---	---	---	---	---	-------------	----		
Dekalb---------	0-3	10-20	1.20-1.50	2.0-20	0.08-0.12	3.6-5.5	Low----------	0.17	2	2-4
	3-27	7-18	1.20-1.50	2.0-20	0.06-0.12	3.6-5.5	Low----------	0.17		
	27	---	---	---	---	---	-------------	----		
Hazleton-------	0-5	7-18	1.20-1.40	2.0-6.0	0.10-0.16	3.6-5.5	Low----------	0.15	3	2-4
	5-35	7-18	1.20-1.40	2.0-20	0.08-0.12	3.6-5.5	Low----------	0.15		
	35-65	5-15	1.20-1.40	2.0-20	0.06-0.12	3.6-5.5	Low----------	0.15		
CeC-------------- Cateache	0-3	15-27	1.20-1.40	0.6-2.0	0.16-0.20	4.5-6.0	Low----------	0.32	3	1-4
	3-20	18-35	1.30-1.60	0.6-2.0	0.12-0.16	4.5-6.0	Moderate-----	0.28		
	20-25	15-35	1.30-1.60	0.6-2.0	0.08-0.12	5.1-6.0	Low----------	0.28		
	25	---	---	---	---	---	-------------	----		
CfC, CfE, CfF, CfG------------- Cateache	0-3	15-27	1.20-1.40	0.6-2.0	0.14-0.18	4.5-6.0	Low----------	0.28	3	1-4
	3-20	18-35	1.30-1.60	0.6-2.0	0.12-0.16	4.5-6.0	Moderate-----	0.28		
	20-25	15-35	1.30-1.60	0.6-2.0	0.08-0.12	5.1-6.0	Low----------	0.28		
	25	---	---	---	---	---	-------------	----		
Ch--------------- Chagrin	0-12	10-27	1.20-1.40	0.6-2.0	0.20-0.24	5.6-7.3	Low----------	0.32	5	2-4
	12-26	18-27	1.20-1.50	0.6-2.0	0.14-0.20	5.6-7.3	Low----------	0.32		
	26-65	5-25	1.20-1.40	0.6-2.0	0.08-0.20	5.6-7.3	Low----------	0.32		
CkB, CkC--------- Clarksburg	0-6	10-27	1.20-1.40	0.6-2.0	0.12-0.18	5.1-6.5	Low----------	0.28	3-2	1-3
	6-23	22-35	1.30-1.50	0.6-2.0	0.12-0.18	5.1-6.5	Moderate-----	0.28		
	23-43	22-35	1.40-1.70	0.06-0.6	0.06-0.12	5.1-6.5	Moderate-----	0.28		
	43-65	22-45	1.20-1.60	0.06-0.6	0.06-0.16	5.1-6.5	Moderate-----	0.28		

See footnote at end of table.

TABLE 16.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS--Continued

Soil name and map symbol	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors		Organic matter
								K	T	
	In	Pct	g/cc	In/hr	In/in	pH				Pct
ClC, ClD Clarksburg	0-6	10-27	1.20-1.40	0.6-2.0	0.12-0.18	5.1-6.5	Low	0.28	3-2	1-3
	6-23	22-35	1.30-1.50	0.6-2.0	0.12-0.18	5.1-6.5	Moderate	0.28		
	23-43	22-35	1.40-1.70	0.06-0.6	0.06-0.12	5.1-6.5	Moderate	0.28		
	43-65	22-40	1.20-1.50	0.06-0.6	0.06-0.16	5.1-6.5	Moderate	0.28		
DeF*:										
Dekalb	0-3	10-20	1.20-1.50	2.0-20	0.08-0.12	3.6-5.5	Low	0.17	2	2-4
	3-27	7-18	1.20-1.50	2.0-20	0.06-0.12	3.6-5.5	Low	0.17		
	27	---	---	---	---	---	-------------	----		
Elliber	0-4	10-20	1.20-1.40	2.0-20	0.06-0.14	3.6-5.5	Low	0.17	3	1-3
	4-65	12-27	1.40-1.60	2.0-20	0.08-0.12	3.6-5.5	Low	0.17		
Blackthorn	0-6	2-10	1.20-1.40	0.6-6.0	0.10-0.15	4.5-6.0	Low	0.20	4	2-5
	6-60	7-18	1.20-1.50	0.6-6.0	0.08-0.12	4.5-6.0	Low	0.20		
	60-72	27-60	1.30-1.60	0.2-2.0	0.14-0.18	4.5-5.5	Moderate	0.28		
DfG*:										
Dekalb	0-3	10-20	1.20-1.50	2.0-20	0.08-0.12	3.6-5.5	Low	0.17	2	2-4
	3-27	7-18	1.20-1.50	2.0-20	0.06-0.12	3.6-5.5	Low	0.17		
	27	---	---	---	---	---	-------------	----		
Elliber	0-4	10-20	1.20-1.40	2.0-20	0.06-0.14	3.6-5.5	Low	0.17	3	1-3
	4-65	12-27	1.40-1.60	2.0-20	0.08-0.12	3.6-5.5	Low	0.17		
Du Dunning	0-8	12-27	1.20-1.40	0.6-2.0	0.19-0.23	5.6-7.8	Low	0.37	5	2-10
	8-65	35-60	1.40-1.65	0.06-0.2	0.14-0.18	5.6-7.8	Moderate	0.28		
EdC, EdD, EdE, EdF Edom	0-6	15-27	1.20-1.50	0.6-2.0	0.12-0.18	5.1-7.3	Low	0.24	3	.5-4
	6-30	35-60	1.30-1.60	0.2-2.0	0.10-0.14	5.1-7.3	Moderate	0.28		
	30-42	27-60	1.30-1.60	0.2-2.0	0.04-0.08	5.6-7.8	Moderate	0.17		
	42	---	---	---	---	---	-------------	----		
ElC, ElD, ElE, ElF Elliber	0-4	10-20	1.20-1.40	2.0-20	0.08-0.12	3.6-5.5	Low	0.17	3	1-3
	4-65	12-27	1.40-1.60	2.0-20	0.08-0.12	3.6-5.5	Low	0.17		
ErB, ErC, ErD Ernest	0-7	15-20	1.20-1.40	0.6-2.0	0.14-0.20	4.5-5.5	Low	0.43	3	2-4
	7-24	20-35	1.30-1.50	0.6-2.0	0.12-0.16	4.5-5.5	Moderate	0.32		
	24-45	18-30	1.40-1.70	0.06-0.6	0.08-0.12	4.5-5.5	Low	0.32		
	45-65	20-35	1.30-1.60	0.06-0.6	0.08-0.12	4.5-5.5	Moderate	0.32		
GaC, GaE, GaF, GaG Gauley	0-6	3-15	1.20-1.40	2.0-6.0	0.10-0.16	3.6-5.5	Low	0.17	2	2-4
	6-18	5-18	1.20-1.40	2.0-6.0	0.07-0.12	3.6-5.5	Low	0.17		
	18-30	5-18	1.20-1.40	2.0-6.0	0.06-0.10	3.6-5.5	Low	0.17		
	30	---	---	---	---	---	-------------	----		
HdC*, HdE*, HdF*, HdG*:										
Hazleton	0-5	7-18	1.20-1.40	2.0-6.0	0.10-0.16	3.6-5.5	Low	0.15	3	2-4
	5-35	7-18	1.20-1.40	2.0-20	0.08-0.12	3.6-5.5	Low	0.15		
	35-65	5-15	1.20-1.40	2.0-20	0.06-0.12	3.6-5.5	Low	0.15		
Dekalb	0-3	10-20	1.20-1.50	2.0-20	0.08-0.12	3.6-5.5	Low	0.17	2	2-4
	3-27	7-18	1.20-1.50	2.0-20	0.06-0.12	3.6-5.5	Low	0.17		
	27	---	---	---	---	---	-------------	----		

See footnote at end of table.

TABLE 16.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS--Continued

Soil name and map symbol	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors K	Erosion factors T	Organic matter
	In	Pct	g/cc	In/hr	In/in	pH				Pct
LaC, LaD--------- Laidig	0-6	10-27	1.20-1.40	0.6-6.0	0.10-0.14	3.6-5.5	Low-----------	0.28	4	1-4
	6-34	18-35	1.30-1.50	0.6-6.0	0.08-0.12	3.6-5.5	Low-----------	0.24		
	34-65	18-35	1.30-1.60	0.06-0.6	0.06-0.10	3.6-5.5	Low-----------	0.17		
LdE-------------- Laidig	0-6	7-27	1.20-1.40	0.6-6.0	0.08-0.12	3.6-5.5	Low-----------	0.28	4	1-4
	6-34	18-35	1.30-1.50	0.6-6.0	0.08-0.10	3.6-5.5	Low-----------	0.28		
	34-65	18-35	1.30-1.70	0.06-0.6	0.06-0.10	3.6-5.5	Low-----------	0.17		
LeF-------------- Laidig	0-6	7-27	1.20-1.40	0.6-6.0	0.08-0.12	3.6-5.5	Low-----------	0.24	4	1-4
	6-34	18-35	1.30-1.50	0.6-6.0	0.08-0.12	3.6-5.5	Low-----------	0.24		
	34-65	18-35	1.30-1.70	0.06-0.6	0.06-0.10	3.6-5.5	Low-----------	0.17		
LgC*:										
Laidig----------	0-6	7-27	1.20-1.40	0.6-6.0	0.08-0.12	3.6-5.5	Low-----------	0.28	4	1-4
	6-34	18-35	1.30-1.50	0.6-6.0	0.08-0.10	3.6-5.5	Low-----------	0.28		
	34-65	18-35	1.30-1.70	0.06-0.6	0.06-0.10	3.6-5.5	Low-----------	0.17		
Buchanan--------	0-3	10-27	1.20-1.40	0.6-2.0	0.12-0.18	3.6-5.5	Low-----------	0.24	3-2	1-4
	3-20	18-30	1.30-1.60	0.6-2.0	0.10-0.16	3.6-5.5	Low-----------	0.24		
	20-65	18-35	1.40-1.70	0.06-0.2	0.06-0.10	3.6-5.5	Low-----------	0.17		
LhC*, LhD*:										
Lehew-----------	0-3	4-16	1.20-1.40	2.0-20	0.08-0.12	4.5-5.5	Low-----------	0.17	3	1-4
	3-30	5-18	1.20-1.40	2.0-20	0.06-0.10	4.5-5.5	Low-----------	0.17		
	30-36	5-18	1.20-1.40	2.0-20	0.06-0.10	4.5-5.5	Low-----------	0.17		
	36	---	---	---	---	---	-------------	----		
Dekalb----------	0-3	10-20	1.20-1.50	2.0-20	0.08-0.12	3.6-5.5	Low-----------	0.17	2	2-4
	3-27	7-18	1.20-1.50	2.0-20	0.06-0.12	3.6-5.5	Low-----------	0.17		
	27	---	---	---	---	---	-------------	----		
LkC*, LkE*, LkF*, LkG*:										
Lehew----------	0-3	4-16	1.20-1.40	2.0-20	0.08-0.12	4.5-5.5	Low-----------	0.17	3	1-4
	3-30	5-18	1.20-1.40	2.0-20	0.06-0.10	4.5-5.5	Low-----------	0.17		
	30-36	5-18	1.20-1.40	2.0-20	0.06-0.10	4.5-5.5	Low-----------	0.17		
	36	---	---	---	---	---	-------------	----		
Hazleton-------	0-5	7-18	1.20-1.40	2.0-6.0	0.10-0.16	3.6-5.5	Low-----------	0.15	3	2-4
	5-35	7-18	1.20-1.40	2.0-20	0.08-0.12	3.6-5.5	Low-----------	0.15		
	35-65	5-15	1.20-1.40	2.0-20	0.06-0.12	3.6-5.5	Low-----------	0.15		
Dekalb---------	0-3	10-20	1.20-1.50	2.0-20	0.08-0.12	3.6-5.5	Low-----------	0.17	2	2-4
	3-27	7-18	1.20-1.50	2.0-20	0.06-0.12	3.6-5.5	Low-----------	0.17		
	27	---	---	---	---	---	-------------	----		
LmF*: Lithic Udorthents.										
Rock outcrop.										
Lo--------------- Lobdell	0-15	15-27	1.20-1.40	0.6-2.0	0.20-0.24	5.6-7.3	Low-----------	0.37	5	1-3
	15-33	18-30	1.25-1.60	0.6-2.0	0.17-0.22	5.6-7.3	Low-----------	0.37		
	33-65	15-30	1.20-1.60	0.6-6.0	0.12-0.18	5.6-7.3	Low-----------	0.37		
MaC, MaD--------- Mandy	0-2	7-25	1.20-1.50	0.6-2.0	0.08-0.12	3.6-5.5	Low-----------	0.24	3	.5-3
	2-22	10-27	1.20-1.60	0.6-2.0	0.04-0.10	3.6-5.5	Low-----------	0.17		
	22-25	10-27	1.20-1.60	0.6-2.0	0.04-0.10	3.6-5.5	Low-----------	0.17		
	25	---	---	---	---	---	-------------	----		

See footnote at end of table.

TABLE 16.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS--Continued

Soil name and map symbol	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors		Organic matter
								K	T	
	In	Pct	g/cc	In/hr	In/in	pH				Pct
MdE, MdF	0-2	7-25	1.20-1.50	0.6-2.0	0.08-0.12	3.6-5.5	Low	0.20	3	.5-3
Mandy	2-22	10-27	1.20-1.60	0.6-2.0	0.04-0.10	3.6-5.5	Low	0.17		
	22-25	10-27	1.20-1.60	0.6-2.0	0.04-0.10	3.6-5.5	Low	0.17		
	25	---	---	---	---	---	-------------	----		
Mn	0-10	20-26	1.20-1.55	0.6-2.0	0.14-0.20	7.4-8.4	Low	0.37	5	4-8
Massanetta	10-31	20-32	1.35-1.65	0.6-2.0	0.14-0.20	7.4-8.4	Low	0.37		
	31-65	22-32	1.30-1.60	0.6-2.0	0.12-0.20	7.4-8.4	Low	0.28		
MoB, MoC	0-7	10-27	1.20-1.40	0.6-2.0	0.18-0.24	4.5-5.5	Low	0.43	3	2-4
Monongahela	7-26	18-35	1.30-1.50	0.6-2.0	0.14-0.18	4.5-5.5	Low	0.43		
	26-48	18-35	1.30-1.70	0.06-0.6	0.08-0.12	4.5-5.5	Low	0.43		
	48-65	10-35	1.20-1.40	0.2-0.6	0.08-0.12	4.5-5.5	Low	0.37		
OeC, OeE, OeF, OeG	0-3	18-27	1.20-1.50	0.6-2.0	0.16-0.21	5.6-7.8	Moderate	0.43	1	2-4
Opequon	3-14	35-75	1.40-1.70	0.6-2.0	0.12-0.16	5.6-7.8	High	0.32		
	14	---	---	---	---	---	-------------	----		
OnC3*, OnD3*, OnE3*, OnF3*:										
Opequon	0-3	27-40	1.20-1.50	0.2-2.0	0.16-0.21	5.6-7.8	High	0.37	1	1-4
	3-14	35-75	1.40-1.70	0.6-2.0	0.12-0.16	5.6-7.8	High	0.32		
	14	---	---	---	---	---	-------------	----		
Caneyville	0-3	30-40	1.25-1.50	0.2-0.6	0.17-0.20	6.1-7.3	Moderate	0.37	2	<2
	3-23	36-60	1.35-1.60	0.2-0.6	0.12-0.18	6.1-7.3	Moderate	0.28		
	23-34	40-60	1.35-1.60	0.2-0.6	0.12-0.18	6.1-7.8	Moderate	0.28		
	34	---	---	---	---	---	-------------	----		
Or	0-10	12-27	1.25-1.45	0.6-2.0	0.18-0.22	6.1-7.3	Low	0.37	5	2-4
Orrville	10-41	18-30	1.30-1.50	0.6-2.0	0.15-0.19	6.1-7.3	Low	0.37		
	41-65	10-25	1.20-1.40	0.6-6.0	0.08-0.15	6.1-7.3	Low	0.37		
Po	0-8	5-15	1.20-1.40	0.6-6.0	0.10-0.14	5.1-7.3	Low	0.24	3	0-2
Potomac	8-68	4-10	1.30-1.60	>6.0	0.03-0.06	5.1-7.3	Low	0.17		
Pt	0-8	5-12	1.20-1.50	2.0-6.0	0.08-0.12	5.1-7.3	Low	0.20	3	0-2
Potomac	8-68	4-10	1.30-1.60	>6.0	0.03-0.06	5.1-7.3	Low	0.17		
Pu	0-11	18-27	1.30-1.50	0.2-0.6	0.18-0.24	3.6-5.5	Moderate	0.43	3	2-4
Purdy	11-36	35-50	1.30-1.60	<0.2	0.12-0.18	3.6-5.5	Moderate	0.32		
	36-65	35-50	1.30-1.60	<0.2	0.10-0.16	3.6-5.5	Moderate	0.32		
Qu*. Quarry										
Ro*: Rock outcrop.										
Rubble land.										
RuF	0-7	18-25	1.20-1.40	>6.0	0.10-0.17	4.5-6.0	Low	0.24	3	1-3
Rushtown	7-34	18-27	1.20-1.40	>6.0	0.06-0.14	4.5-6.0	Low	0.24		
	34-65	18-27	1.20-1.40	>6.0	0.03-0.12	4.5-6.0	Low	0.17		
ShC, ShE	0-5	15-27	1.35-1.50	0.6-2.0	0.13-0.20	4.5-6.0	Low	0.24	5	.5-3
Shouns	5-45	18-35	1.40-1.60	0.6-2.0	0.12-0.18	4.5-6.0	Low	0.28		
	45-65	15-35	1.40-1.60	0.6-2.0	0.09-0.15	4.5-6.0	Low	0.28		

See footnote at end of table.

TABLE 16.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS--Continued

Soil name and map symbol	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors		Organic matter
								K	T	
	In	Pct	g/cc	In/hr	In/in	pH				Pct
SnC, SnE, SnF---- Shouns	0-5	15-27	1.35-1.50	0.6-2.0	0.11-0.18	4.5-6.0	Low----------	0.20	5	.5-3
	5-45	18-35	1.40-1.60	0.6-2.0	0.12-0.18	4.5-6.0	Low----------	0.28		
	45-65	15-35	1.40-1.60	0.6-2.0	0.09-0.15	4.5-6.0	Low----------	0.28		
SoC, SoE, SoF---- Shouns	0-5	12-25	1.35-1.50	0.6-6.0	0.13-0.20	4.5-6.0	Low----------	0.17	3	2-4
	5-45	18-35	1.35-1.55	0.6-2.0	0.12-0.18	4.5-6.0	Low----------	0.24		
	45-65	15-35	1.35-1.55	0.6-2.0	0.09-0.15	4.5-6.0	Low----------	0.24		
SrB-------------- Simoda	0-5	10-27	1.20-1.50	0.6-2.0	0.10-0.14	3.6-5.5	Low----------	0.17	3	1-4
	5-26	18-35	1.20-1.50	0.6-2.0	0.12-0.16	3.6-5.5	Low----------	0.24		
	26-40	18-35	1.40-1.70	0.06-0.2	0.08-0.12	3.6-5.5	Low----------	0.24		
	40-65	18-35	1.20-1.50	0.2-0.6	0.08-0.12	3.6-5.5	Low----------	0.24		
	65	---	---	---	---	---	-------------	----		
Tg--------------- Tioga	0-8	5-18	1.15-1.40	0.6-6.0	0.15-0.21	5.6-7.3	Low----------	0.37	5	2-6
	8-44	5-18	1.15-1.45	0.6-6.0	0.07-0.20	5.6-7.3	Low----------	0.28		
	44-65	3-15	1.25-1.55	0.6-20	0.02-0.20	5.6-7.8	Low----------	0.28		
ToB-------------- Toms	0-5	12-20	1.20-1.35	0.6-2.0	0.18-0.22	5.6-7.8	Low----------	0.43	3	2-4
	5-13	12-27	1.20-1.35	0.6-2.0	0.18-0.22	5.6-7.8	Low----------	0.43		
	13-30	35-60	1.25-1.40	0.06-0.2	0.12-0.16	5.6-7.8	Moderate-----	0.32		
	30-46	35-60	1.25-1.40	0.06-0.2	0.12-0.16	5.6-7.8	Moderate-----	0.32		
	46-65	35-50	1.25-1.40	0.06-0.2	0.12-0.16	5.6-7.8	Moderate-----	0.32		
TrC-------------- Trussel	0-2	7-25	1.20-1.50	0.6-2.0	0.10-0.17	3.6-5.5	Low----------	0.24	4	1-4
	2-12	18-35	1.30-1.50	0.6-2.0	0.09-0.17	3.6-5.5	Low----------	0.28		
	12-21	18-27	1.40-1.70	0.06-0.6	0.09-0.13	3.6-5.5	Low----------	0.24		
	21-65	18-27	1.30-1.60	0.6-2.0	0.10-0.14	3.6-5.5	Low----------	0.28		
TsC-------------- Trussel	0-2	7-25	1.20-1.50	0.6-2.0	0.10-0.17	3.6-5.5	Low----------	0.17	4	1-4
	2-12	18-35	1.30-1.50	0.6-2.0	0.09-0.17	3.6-5.5	Low----------	0.28		
	12-21	18-27	1.40-1.70	0.06-0.6	0.09-0.13	3.6-5.5	Low----------	0.24		
	21-65	18-27	1.30-1.60	0.6-2.0	0.10-0.14	3.6-5.5	Low----------	0.24		
TyB-------------- Tygart	0-9	15-27	1.20-1.40	0.6-2.0	0.18-0.22	4.5-5.5	Low----------	0.43	3	2-4
	9-39	35-50	1.20-1.50	0.06-0.2	0.10-0.14	4.5-5.5	Moderate-----	0.32		
	39-65	35-50	1.30-1.60	0.06-0.2	0.10-0.14	4.5-5.5	Moderate-----	0.32		
Ud. Udorthents										

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 17.--SOIL AND WATER FEATURES

("Flooding" and "water table" and terms such as "occasional," "apparent," and "perched" are explained in the text. The symbol < means less than; > means more than. Absence of an entry indicates that the feature is not a concern or that data were not estimated)

Soil name and map symbol	Hydrologic group	Frequency of flooding	High water table		Bedrock		Potential frost action	Risk of corrosion	
			Depth	Kind	Depth	Hardness		Uncoated steel	Concrete
			Ft		In				
AgB, AgC Allegheny	B	None	>6.0	---	>60	---	Low	Low	High.
BcC*, BcD*, BeC*, BeE*, BeF*, BeG*:									
Belmont	B	None	>6.0	---	40-60	Hard	Moderate	Moderate	Moderate.
Cateache	C	None	>6.0	---	20-40	Soft	Moderate	Moderate	Moderate.
BkC, BkD, BkE, BkF, BmE, BmF, BmG Berks	C	None	>6.0	---	20-40	Soft	Low	Low	High.
BnC*, BnD*, BnD3*, BnF*, BnF3*, BnG*, BnG3*:									
Berks	C	None	>6.0	---	20-40	Soft	Low	Low	High.
Weikert	C/D	None	>6.0	---	10-20	Soft	Low	Low	High.
BrC, BrD, BsC, BsE, BsF Blackthorn	B	None	>6.0	---	>60	---	Low	Moderate	High.
BtC*, BtE*:									
Blackthorn	B	None	>6.0	---	>60	---	Low	Moderate	High.
Dekalb	C	None	>6.0	---	20-40	Hard	Low	Low	High.
Elliber	A	None	>6.0	---	>60	---	Low	Low	High.
BuB, BuC Buchanan	C	None	1.5-3.0	Perched	>60	---	Moderate	High	High.
CaC, CaD Calvin	C	None	>6.0	---	20-40	Soft	Low	Low	Moderate.
CdC*, CdE*, CdF*, CdG*:									
Calvin	C	None	>6.0	---	20-40	Soft	Low	Low	Moderate.
Dekalb	C	None	>6.0	---	20-40	Hard	Low	Low	High.

See footnote at end of table.

TABLE 17.--SOIL AND WATER FEATURES--Continued

Soil name and map symbol	Hydrologic group	Frequency of flooding	High water table		Bedrock		Potential frost action	Risk of corrosion	
			Depth	Kind	Depth	Hardness		Uncoated steel	Concrete
			Ft		In				
CdC*, CdE*, CdF*, CdG*:									
Hazleton--------	B	None------------	>6.0	---	>40	Hard	Low------	Low------	High.
CeC, CfC, CfE, CfF, CfG--------- Cateache	C	None------------	>6.0	---	20-40	Soft	Moderate	Moderate	Moderate.
Ch---------------- Chagrin	B	Occasional------	4.0-6.0	Apparent	>60	---	Moderate	Low------	Moderate.
CkB, CkC, ClC, ClD-------------- Clarksburg	C	None------------	1.5-3.0	Perched	>60	---	Moderate	Moderate	Moderate.
DeF*:									
Dekalb-----------	C	None------------	>6.0	---	20-40	Hard	Low------	Low------	High.
Elliber----------	A	None------------	>6.0	---	>60	---	Low------	Low------	High.
Blackthorn-------	B	None------------	>6.0	---	>60	---	Low------	Moderate	High.
DfG*:									
Dekalb-----------	C	None------------	>6.0	---	20-40	Hard	Low------	Low------	High.
Elliber----------	A	None------------	>6.0	---	>60	---	Moderate	Low------	High.
Du---------------- Dunning	D	Occasional------	0-0.5	Apparent	>60	---	High-----	High-----	Moderate.
EdC, EdD, EdE, EdF-------------- Edom	C	None------------	>6.0	---	40-60	Soft	Moderate	High-----	Low.
ElC, ElD, ElE, ElF-------------- Elliber	A	None------------	>6.0	---	>60	---	Low------	Low------	High.
ErB, ErC, ErD----- Ernest	C	None------------	1.5-3.0	Perched	>60	---	Moderate	Moderate	Moderate.
GaC, GaE, GaF, GaG-------------- Gauley	C	None------------	>6.0	---	20-40	Hard	Moderate	Low------	High.
HdC*, HdE*, HdF*, HdG*:									
Hazleton--------	B	None------------	>6.0	---	>40	Hard	Low------	Low------	High.

See footnote at end of table.

TABLE 17.--SOIL AND WATER FEATURES--Continued

Soil name and map symbol	Hydrologic group	Frequency of flooding	High water table		Bedrock		Potential frost action	Risk of corrosion	
			Depth	Kind	Depth	Hardness		Uncoated steel	Concrete
			Ft		In				
HdC*, HdE*, HdF*, HdG*:									
Dekalb----------	C	None------------	>6.0	---	20-40	Hard	Low------	Low------	High.
LaC, LaD, LdE, LeF-------------- Laidig	C	None------------	2.5-4.0	Perched	>60	---	Moderate	Moderate	High.
LgC*:									
Laidig-----------	C	None------------	2.5-4.0	Perched	>60	---	Moderate	Moderate	High.
Buchanan---------	C	None------------	1.5-3.0	Perched	>60	---	Moderate	High-----	High.
LhC*, LhD*:									
Lehew------------	C	None------------	>6.0	---	20-40	Hard	Low------	Low------	High.
Dekalb-----------	C	None------------	>6.0	---	20-40	Hard	Low------	Low------	High.
LkC*, LkE*, LkF*, LkG*:									
Lehew-----------	C	None------------	>6.0	---	20-40	Hard	Low------	Low------	High.
Hazleton--------	B	None------------	>6.0	---	>40	Hard	Low------	Low------	High.
Dekalb----------	C	None------------	>6.0	---	20-40	Hard	Low------	Low------	High.
LmF*:									
Lithic Udorthents.									
Rock outcrop.									
Lo---------------- Lobdell	B	Occasional------	1.5-3.0	Apparent	>60	---	High-----	Low------	Moderate.
MaC, MaD, MdE, MdF-------------- Mandy	C	None------------	>6.0	---	20-40	Soft	Low------	Low------	High.
Mn---------------- Massanetta	B	Occasional------	4.0-6.0	Apparent	>60	---	Moderate	Low------	Low.
MoB, MoC---------- Monongahela	C	None------------	1.5-3.0	Perched	>60	---	Moderate	High-----	High.
OeC, OeE, OeF, OeG-------------- Opequon	C	None------------	>6.0	---	12-20	Hard	Moderate	Moderate	Low.

See footnote at end of table.

TABLE 17.--SOIL AND WATER FEATURES--Continued

Soil name and map symbol	Hydrologic group	Frequency of flooding	High water table		Bedrock		Potential frost action	Risk of corrosion	
			Depth	Kind	Depth	Hardness		Uncoated steel	Concrete
			Ft		In				
OnC3*, OnD3*, OnE3*, OnF3*:									
Opequon---------	C	None------------	>6.0	---	12-20	Hard	Moderate	Moderate	Low.
Caneyville------	C	None------------	>6.0	---	20-40	Hard	Moderate	High-----	Moderate.
Or--------------- Orrville	C	Occasional------	1.0-2.5	Apparent	>60	---	High-----	High-----	Moderate.
Po, Pt----------- Potomac	A	Occasional------	4.0-6.0	Apparent	>60	---	Low------	Low------	Moderate.
Pu--------------- Purdy	D	None------------	+1-1.0	Apparent	>60	---	High-----	High-----	High.
Qu*-------------- Quarry	---	None------------	>6.0	---	0	Hard	---	---	---
Ro*:									
Rock outcrop-----	D	None------------	>6.0	---	0	Hard	---	---	---
Rubble land------	A	None------------	>6.0	---	>40	Hard	---	---	---
RuF-------------- Rushtown	A	None------------	>6.0	---	>60	---	Low------	Low------	Moderate.
ShC, ShE, SnC, SnE, SnF, SoC, SoE, SoF--------- Shouns	B	None------------	>6.0	---	>60	---	Moderate	Moderate	Moderate.
SrB-------------- Simoda	C	None------------	1.5-2.5	Perched	40-72	Hard	Moderate	Moderate	High.
Tg--------------- Tioga	B	Occasional------	3.0-6.0	Apparent	>60	---	Moderate	Low------	Moderate.
ToB-------------- Toms	C	None------------	0.5-1.5	Perched	>60	---	High-----	High-----	High.
TrC, TsC--------- Trussel	C	None------------	0-0.5	Perched	>60	---	High-----	High-----	High.
TyB-------------- Tygart	D	None------------	0.5-1.5	Perched	>60	---	Moderate	High-----	High.
Ud. Udorthents									

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 18.--CLASSIFICATION OF THE SOILS

(An asterisk in the first column indicates that the soil is a taxadjunct to the series. See text for a description of those characteristics of the soil that are outside the range of the series)

Soil name	Family or higher taxonomic class
Allegheny	Fine-loamy, mixed, mesic Typic Hapludults
Belmont	Fine-loamy, mixed, mesic Typic Hapludalfs
Berks	Loamy-skeletal, mixed, mesic Typic Dystrochrepts
Blackthorn	Loamy-skeletal, mixed, mesic Typic Hapludults
Buchanan	Fine-loamy, mixed, mesic Aquic Fragiudults
Calvin	Loamy-skeletal, mixed, mesic Typic Dystrochrepts
Caneyville	Fine, mixed, mesic Typic Hapludalfs
Cateache	Fine-loamy, mixed, mesic Ultic Hapludalfs
Chagrin	Fine-loamy, mixed, mesic Dystric Fluventic Eutrochrepts
Clarksburg	Fine-loamy, mixed, mesic Typic Fragiudalfs
Dekalb	Loamy-skeletal, mixed, mesic Typic Dystrochrepts
Dunning	Fine, mixed, mesic Fluvaquentic Haplaquolls
Edom	Fine, illitic, mesic Typic Hapludalfs
Elliber	Loamy-skeletal, mixed, mesic Typic Hapludults
Ernest	Fine-loamy, mixed, mesic Aquic Fragiudults
Gauley	Loamy-skeletal, siliceous, frigid Typic Haplorthods
Hazleton	Loamy-skeletal, mixed, mesic Typic Dystrochrepts
Laidig	Fine-loamy, siliceous, mesic Typic Fragiudults
Lehew	Loamy-skeletal, siliceous, mesic Typic Dystrochrepts
Lobdell	Fine-loamy, mixed, mesic Fluvaquentic Eutrochrepts
Mandy	Loamy-skeletal, mixed, frigid Typic Dystrochrepts
*Massanetta	Fine-loamy, carbonatic, mesic Fluvaquentic Hapludolls
Monongahela	Fine-loamy, mixed, mesic Typic Fragiudults
Opequon	Clayey, mixed, mesic Lithic Hapludalfs
Orrville	Fine-loamy, mixed, nonacid, mesic Aeric Fluvaquents
Potomac	Sandy-skeletal, mixed, mesic Typic Udifluvents
Purdy	Clayey, mixed, mesic Typic Ochraquults
Rushtown	Loamy-skeletal over fragmental, mixed, mesic Typic Dystrochrepts
Shouns	Fine-loamy, mixed, mesic Typic Hapludults
Simoda	Fine-loamy, mixed, frigid Typic Fragiochrepts
Tioga	Coarse-loamy, mixed, mesic Dystric Fluventic Eutrochrepts
Toms	Fine, mixed, mesic Aeric Ochraqualfs
Trussel	Fine-loamy, mixed, frigid Aeric Fragiaquepts
Tygart	Clayey, mixed, mesic Aeric Ochraquults
Udorthents	Udorthents
Weikert	Loamy-skeletal, mixed, mesic Lithic Dystrochrepts

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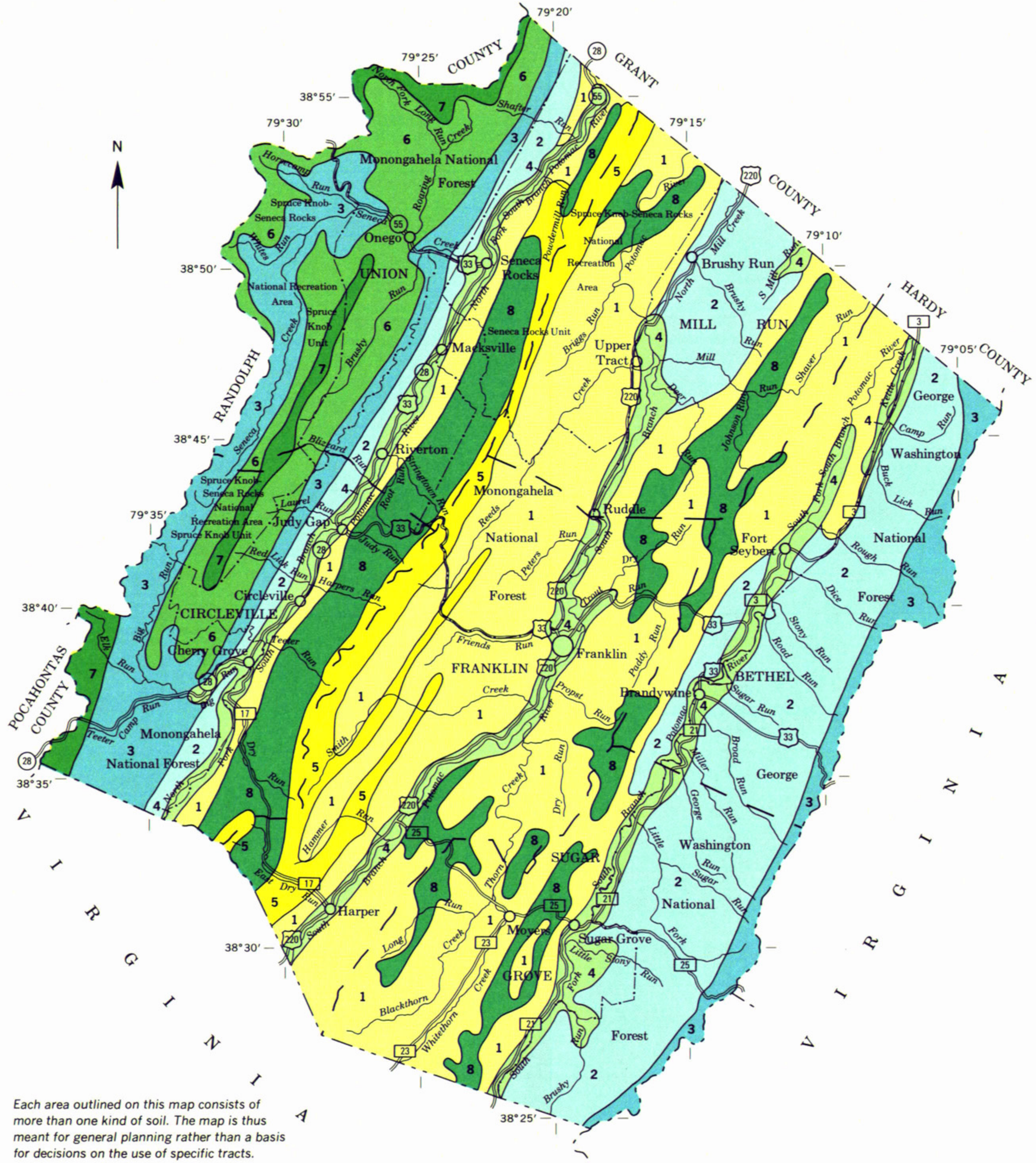


Each area outlined on this map consists of more than one kind of soil. The map is thus meant for general planning rather than a basis for decisions on the use of specific tracts.

LEGEND

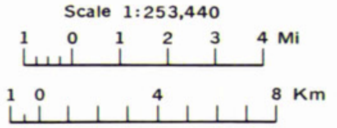
1	DEKALB-BLACKTHORN-ELLIBER: Moderately deep and very deep, well drained, gently sloping to extremely steep soils; on uplands
2	BERKS-WEIKERT: Moderately deep and shallow, well drained, strongly sloping to extremely steep soils; on uplands
3	CALVIN-DEKALB-HAZLETON: Moderately deep to very deep, well drained, gently sloping to extremely steep soils; on uplands
4	POTOMAC-CLARKSBURG-ERNEST: Very deep, somewhat excessively drained and moderately well drained, nearly level to moderately steep soils; on flood plains and uplands
5	LEHEW-HAZLETON-DEKALB: Moderately deep to very deep, well drained, gently sloping to extremely steep soils; on uplands
6	CATEACHE-SHOUNS-BELMONT: Moderately deep to very deep, well drained, gently sloping to extremely steep soils; on uplands
7	MANDY-GAULEY-TRUSSEL: Moderately deep to very deep, well drained and poorly drained, gently sloping to extremely steep soils; on uplands at high elevations
8	OPEQUON-BERKS-BLACKTHORN: Shallow, moderately deep, and very deep, well drained, gently sloping to extremely steep soils; on uplands

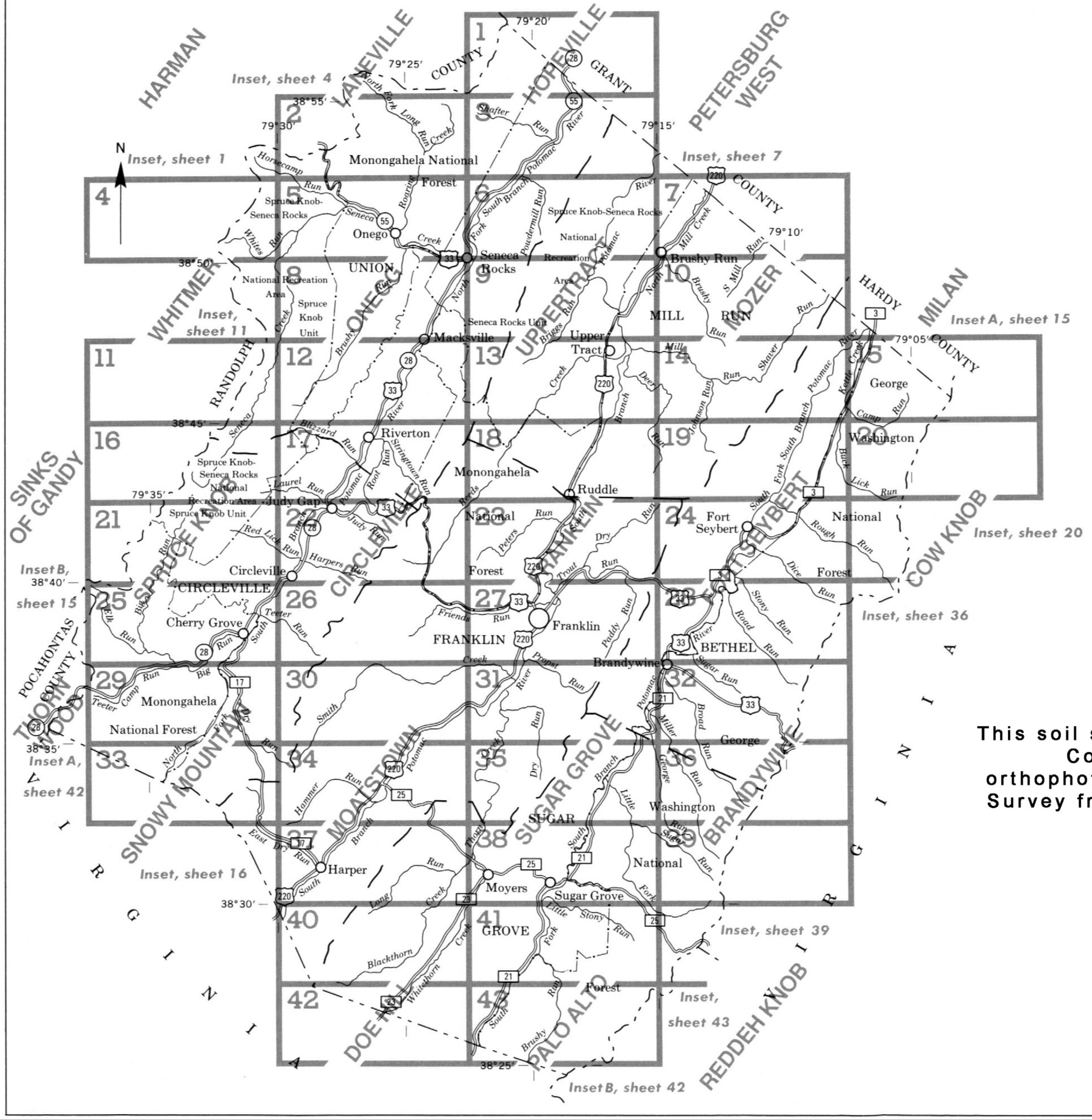
Compiled 1991

UNITED STATES DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
WEST VIRGINIA AGRICULTURAL AND FORESTRY EXPERIMENT STATION
UNITED STATES DEPARTMENT OF AGRICULTURE FOREST SERVICE

GENERAL SOIL MAP

PENDLETON COUNTY, WEST VIRGINIA



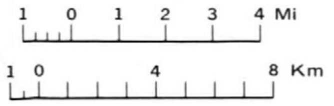


Original text from each individual map sheet read:
This soil survey map was compiled by the U. S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of the Interior, Geological Survey from 1976 - 1979 photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

INDEX TO MAP SHEETS

PENDLETON COUNTY, WEST VIRGINIA

Scale 1:253,440



SOIL LEGEND

Publication symbols consist of a combination of letters. The first letter, always a capital, is the initial letter of the soil name. The second letter, always lowercase, separates units having names that begin with the same letter, except that it does not separate slope phases. The third letter, always a capital A, B, C, D, E, F, or G, indicates the slope. Most symbols without a slope letter are for nearly level soils, for soils named at categories above the series, or for miscellaneous areas that have variable slope ranges.

SYMBOL	NAME
AgB	Allegheny loam, 3 to 8 percent slopes
AgC	Allegheny loam, 8 to 15 percent slopes
BcC	Belmont-Cateache silt loams, 8 to 15 percent slopes
BcD	Belmont-Cateache silt loams, 15 to 25 percent slopes
BeC	Belmont-Cateache silt loams, 3 to 15 percent slopes, stony
BeE	Belmont-Cateache silt loams, 15 to 35 percent slopes, stony
BeF	Belmont-Cateache silt loams, 35 to 55 percent slopes, stony
BeG	Belmont-Cateache silt loams, 55 to 80 percent slopes, stony
BkC	Berks channery silt loam, 8 to 15 percent slopes
BkD	Berks channery silt loam, 15 to 25 percent slopes
BkE	Berks channery silt loam, 25 to 35 percent slopes
BkF	Berks channery silt loam, 35 to 55 percent slopes
BmE	Berks channery loam, 15 to 35 percent slopes, stony
BmF	Berks channery loam, 35 to 55 percent slopes, stony
BmG	Berks channery loam, 55 to 80 percent slopes, stony
BnC	Berks-Weikert channery silt loams, 8 to 15 percent slopes
BnD	Berks-Weikert channery silt loams, 15 to 25 percent slopes
BnD3	Berks-Weikert channery silt loams, 15 to 25 percent slopes, severely eroded
BnF	Berks-Weikert channery silt loams, 25 to 55 percent slopes
BnF3	Berks-Weikert channery silt loams, 25 to 55 percent slopes, severely eroded
BnG	Berks-Weikert channery silt loams, 55 to 80 percent slopes
BnG3	Berks-Weikert channery silt loams, 55 to 80 percent slopes, severely eroded
BrC	Blackthorn channery sandy loam, 8 to 15 percent slopes
BrD	Blackthorn channery sandy loam, 15 to 25 percent slopes
BsC	Blackthorn channery sandy loam, 3 to 15 percent slopes, stony
BsE	Blackthorn channery sandy loam, 15 to 35 percent slopes, stony
BsF	Blackthorn channery sandy loam, 35 to 55 percent slopes, stony
BtC	Blackthorn-Dekalb-Elliber association, 3 to 15 percent slopes, stony
BtE	Blackthorn-Dekalb-Elliber association, 15 to 35 percent slopes, stony
BuB	Buchanan channery loam, 3 to 8 percent slopes
BuC	Buchanan channery loam, 8 to 15 percent slopes
CaC	Calvin channery silt loam, 3 to 15 percent slopes
CaD	Calvin channery silt loam, 15 to 25 percent slopes
CdC	Calvin-Dekalb-Hazleton complex, 3 to 15 percent slopes, stony
CdE	Calvin-Dekalb-Hazleton complex, 15 to 35 percent slopes, stony
CdF	Calvin-Dekalb-Hazleton complex, 35 to 55 percent slopes, stony
CdG	Calvin-Dekalb-Hazleton complex, 55 to 80 percent slopes, stony
CeC	Cateache silt loam, 8 to 15 percent slopes
CfC	Cateache channery silt loam, 3 to 15 percent slopes, stony
CfE	Cateache channery silt loam, 15 to 35 percent slopes, stony
CfF	Cateache channery silt loam, 35 to 55 percent slopes, stony
CfG	Cateache channery silt loam, 55 to 80 percent slopes, stony
Ch	Chagrin loam
CkB	Clarksburg channery silt loam, 3 to 8 percent slopes
CkC	Clarksburg channery silt loam, 8 to 15 percent slopes
ClC	Clarksburg channery silt loam, 3 to 15 percent slopes, stony
ClD	Clarksburg channery silt loam, 15 to 25 percent slopes, stony
DeF	Dekalb-Elliber-Blackthorn association, 35 to 55 percent slopes, stony
DfG	Dekalb-Elliber association, 55 to 80 percent slopes, stony
Du	Dunning silt loam
EdC	Edom channery silt loam, 8 to 15 percent slopes
EdD	Edom channery silt loam, 15 to 25 percent slopes
EdE	Edom channery silt loam, 25 to 35 percent slopes
EdF	Edom channery silt loam, 35 to 55 percent slopes
ElC	Elliber extremely channery loam, 8 to 15 percent slopes
ElD	Elliber extremely channery loam, 15 to 25 percent slopes
ElE	Elliber extremely channery loam, 25 to 35 percent slopes
ElF	Elliber extremely channery loam, 35 to 55 percent slopes
ErB	Ernest silt loam, 3 to 8 percent slopes
ErC	Ernest silt loam, 8 to 15 percent slopes
ErD	Ernest silt loam, 15 to 25 percent slopes
GaC	Gauley channery loam, 3 to 15 percent slopes, rubbly
GaE	Gauley channery loam, 15 to 35 percent slopes, rubbly
GaF	Gauley channery loam, 35 to 55 percent slopes, rubbly
GaG	Gauley channery loam, 55 to 80 percent slopes, rubbly
HdC	Hazleton-Dekalb complex, 3 to 15 percent slopes, stony
HdE	Hazleton-Dekalb complex, 15 to 35 percent slopes, stony
HdF	Hazleton-Dekalb complex, 35 to 55 percent slopes, stony
HdG	Hazleton-Dekalb complex, 55 to 80 percent slopes, stony
LaC	Laidig channery loam, 8 to 15 percent slopes
LaD	Laidig channery loam, 15 to 25 percent slopes
LdE	Laidig channery loam, 15 to 35 percent slopes, stony
LeF	Laidig channery loam, 35 to 55 percent slopes, very stony
LgC	Laidig and Buchanan soils, 3 to 15 percent slopes, stony
LhC	Lehew and Dekalb soils, 8 to 15 percent slopes
LhD	Lehew and Dekalb soils, 15 to 25 percent slopes
LkC	Lehew, Hazleton, and Dekalb soils, 3 to 15 percent slopes, stony
LkE	Lehew, Hazleton, and Dekalb soils, 15 to 35 percent slopes, stony
LkF	Lehew, Hazleton, and Dekalb soils, 35 to 55 percent slopes, stony
LkG	Lehew, Hazleton, and Dekalb soils, 55 to 80 percent slopes, stony
LmF	Lithic Udorthents-Rock outcrop complex, 35 to 80 percent slopes
Lo	Lobdell loam
MaC	Mandy channery silt loam, 8 to 15 percent slopes
MaD	Mandy channery silt loam, 15 to 25 percent slopes
MdE	Mandy channery silt loam, 15 to 35 percent slopes, stony
MdF	Mandy channery silt loam, 35 to 55 percent slopes, stony
Mn	Massanetta silt loam
MoB	Monongahela silt loam, 3 to 8 percent slopes
MoC	Monongahela silt loam, 8 to 15 percent slopes
OeC	Opequon silt loam, 3 to 15 percent slopes, very rocky
OeE	Opequon silt loam, 15 to 35 percent slopes, very rocky
OeF	Opequon silt loam, 35 to 55 percent slopes, very rocky
OeG	Opequon silt loam, 55 to 80 percent slopes, very rocky
OnC3	Opequon-Caneyville silty clay loams, 8 to 15 percent slopes, severely eroded
OnD3	Opequon-Caneyville silty clay loams, 15 to 25 percent slopes, severely eroded
OnE3	Opequon-Caneyville silty clay loams, 25 to 35 percent slopes, severely eroded
OnF3	Opequon-Caneyville silty clay loams, 35 to 55 percent slopes, severely eroded
Or	Orrville loam
Po	Potomac fine sandy loam
Pt	Potomac very cobbly fine sandy loam
Pu	Purdy silt loam
Qu	Quarry, limestone
Ro	Rock outcrop and Rubble land
RuF	Rushtown channery silt loam, 35 to 55 percent slopes
ShC	Shouns channery loam, 3 to 15 percent slopes, stony
ShE	Shouns channery loam, 15 to 35 percent slopes, stony
SnC	Shouns channery loam, 3 to 15 percent slopes, very stony
SnE	Shouns channery loam, 15 to 35 percent slopes, very stony
SnF	Shouns channery loam, 35 to 55 percent slopes, very stony
SoC	Shouns channery loam, 3 to 15 percent slopes, rubbly
SoE	Shouns channery loam, 15 to 35 percent slopes, rubbly
SoF	Shouns channery loam, 35 to 55 percent slopes, rubbly
SrB	Simoda channery loam, 3 to 15 percent slopes, extremely stony
Tg	Tioga loam
ToB	Toms silt loam, 3 to 8 percent slopes
TrC	Trussel channery loam, 3 to 15 percent slopes
TsC	Trussel channery loam, 3 to 15 percent slopes, extremely stony
TyB	Tygart silt loam, 3 to 8 percent slopes
Ud	Udorthents, smoothed

CONVENTIONAL AND SPECIAL SYMBOLS LEGEND

CULTURAL FEATURES

BOUNDARIES	
National, state or province	——— – –
County or parish	——— –
Minor civil division	— — —
Reservation (national forest or park, state forest or park, and large airport)	—— · ——
Land grant	—— ·· ——
Limit of soil survey (label)	———
Field sheet matchline and neatline	———
AD HOC BOUNDARY (label)	Swift Airport
Small airport, airfield, park, oilfield, cemetery, or flood pool	FLOOD POOL LINE
STATE COORDINATE TICK	—┴—
LAND DIVISION CORNER (sections and land grants)	└ ┴ + ┼
ROADS	
Divided (median shown if scale permits)	═══
Other roads	———
Trail	- - - -
ROAD EMBLEM & DESIGNATIONS	
Interstate	21
Federal	173
State	28
County, farm or ranch	1283
RAILROAD	—+—+—+—
POWER TRANSMISSION LINE (normally not shown)	··········
PIPE LINE (normally not shown)	├─┤├─┤├─┤
FENCE (normally not shown)	—×——×—
LEVEES	
Without road	|||||||||||
With road	═══
With railroad	┼┼┼┼┼
DAMS	
Large (to scale)	⬭
Medium or Small	water w
PITS	
Gravel pit	✕
Mine or quarry	⚒

MISCELLANEOUS CULTURAL FEATURES	
Farmstead, house (omit in urban areas)	•
Church	⫯
School	⫯
Indian mound (label)	⌒ Indian Mound
Located object (label)	○ Tower
Tank (label)	• Gas
Wells, oil or gas	♁
Windmill	✲
Kitchen midden	⌐

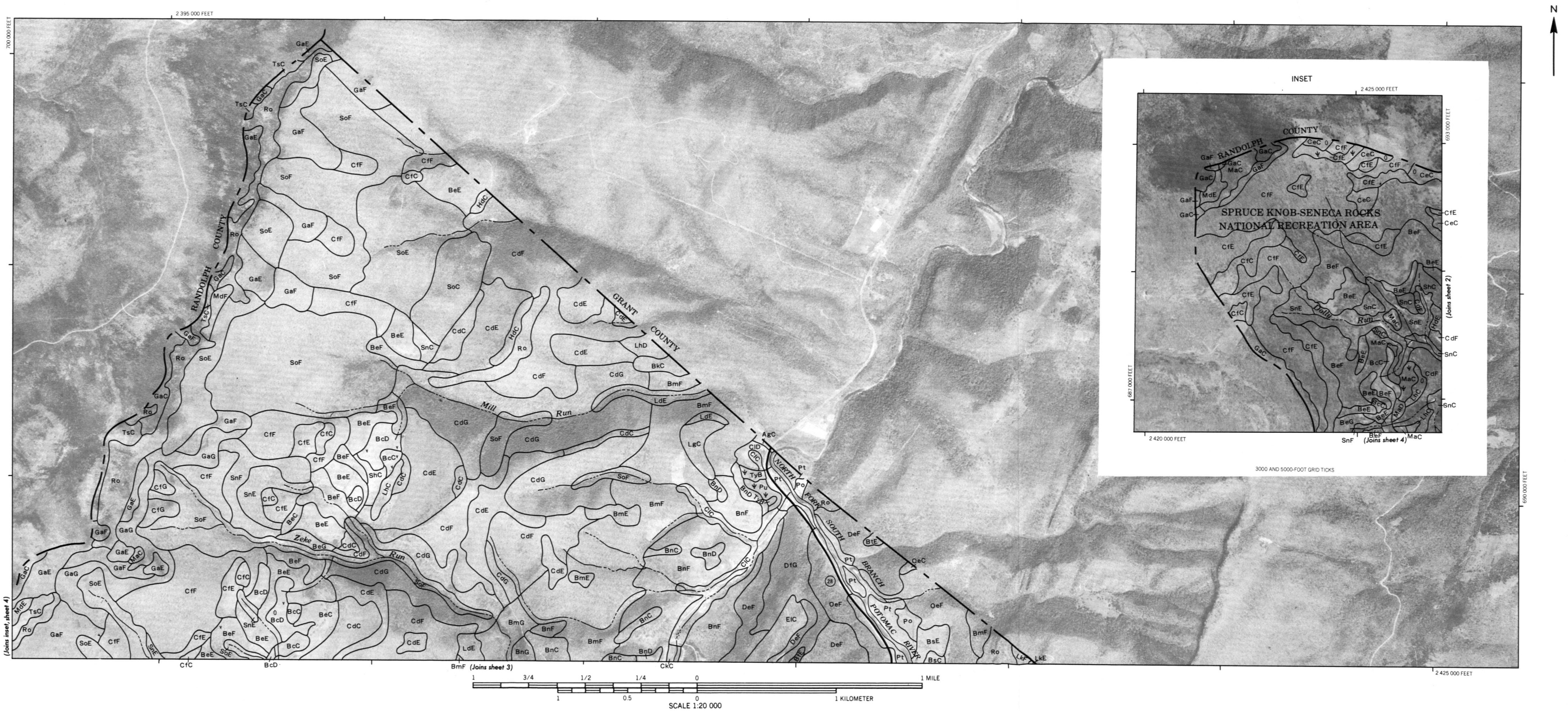
WATER FEATURES

DRAINAGE	
Perennial, double line	≈
Perennial, single line	~·~
Unclassified	~···~
Drainage end	~··→
Canals or ditches	
Double-line (label)	CANAL
Drainage and/or irrigation	—→·—→
LAKES, PONDS AND RESERVOIRS	
Perennial	water w
Intermittent	int i
MISCELLANEOUS WATER FEATURES	
Marsh or swamp	ψ
Spring	⊸
Well, artesian	◆
Well, irrigation	-○-
Wet spot	↓

SPECIAL SYMBOLS FOR SOIL SURVEY

SOIL DELINEATIONS AND SYMBOLS	AgB LeF
ESCARPMENTS	
Bedrock (points down slope)	vvvvvvvvvvvvvvvv
Other than bedrock (points down slope)	'''''''''''''''''''''
SHORT STEEP SLOPE	············
GULLY	∿∿∿∿∿∿
DEPRESSION OR SINK	◊
SOIL SAMPLE (normally not shown)	Ⓢ
MISCELLANEOUS	
Blowout	◡
Clay spot	※
Gravelly spot	∴
Gumbo, slick or scabby spot (sodic)	ø
Dumps and other similar non soil areas	≡
Prominent hill or peak	☼
Rock outcrop (includes sandstone and shale)	v
Saline spot	+
Sandy spot	⁙
Gullied Land	÷
Slide or slip (tips point upslope)	)))
Stony spot, Cover 1-3%	0 ∞

PENDLETON COUNTY, WEST VIRGINIA — SHEET NUMBER 1



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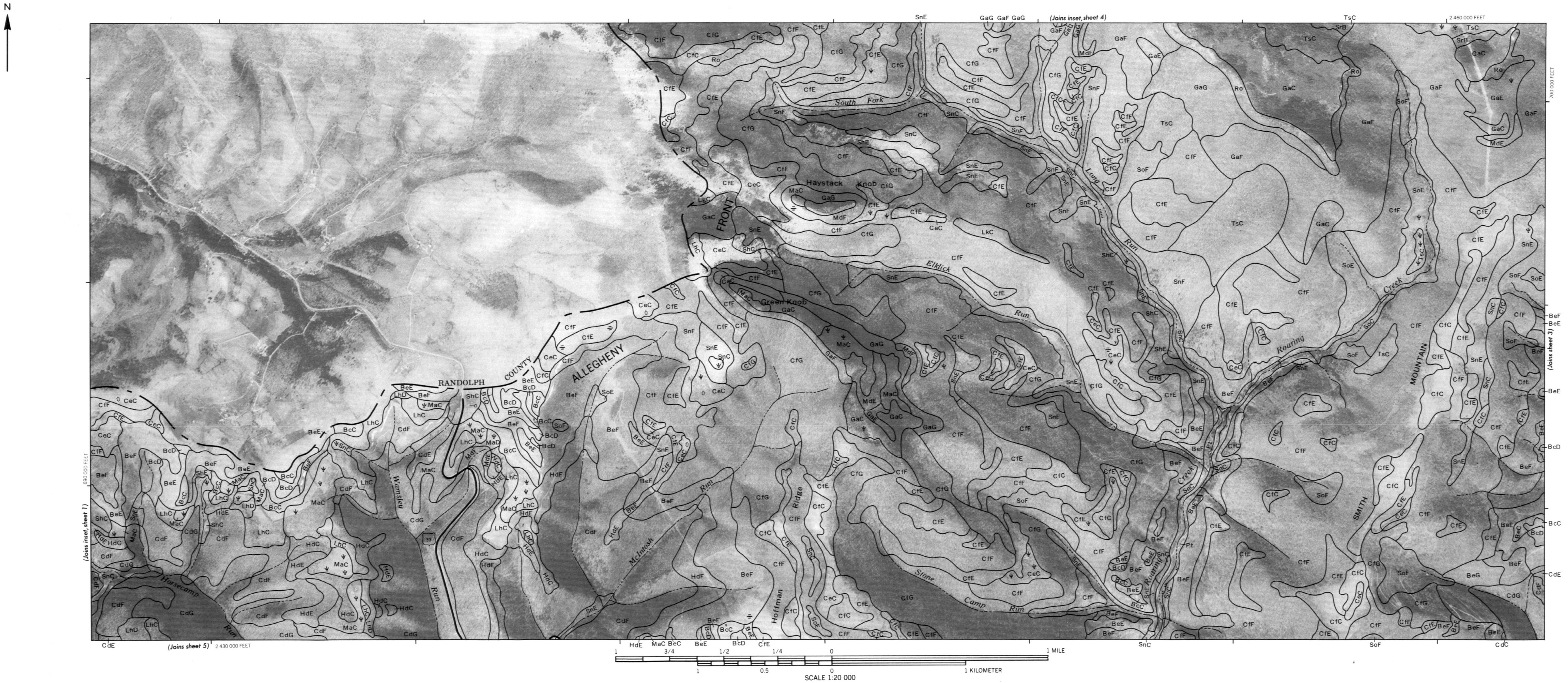

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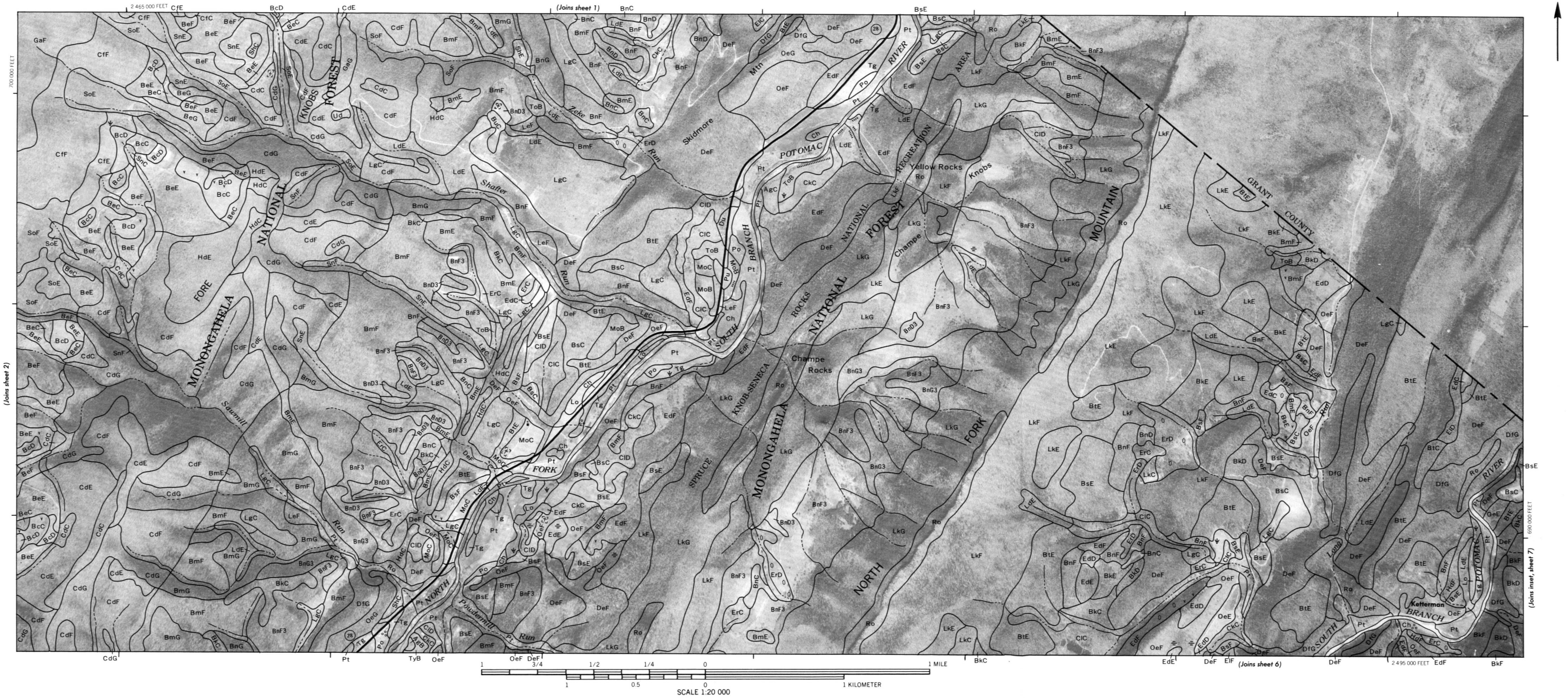

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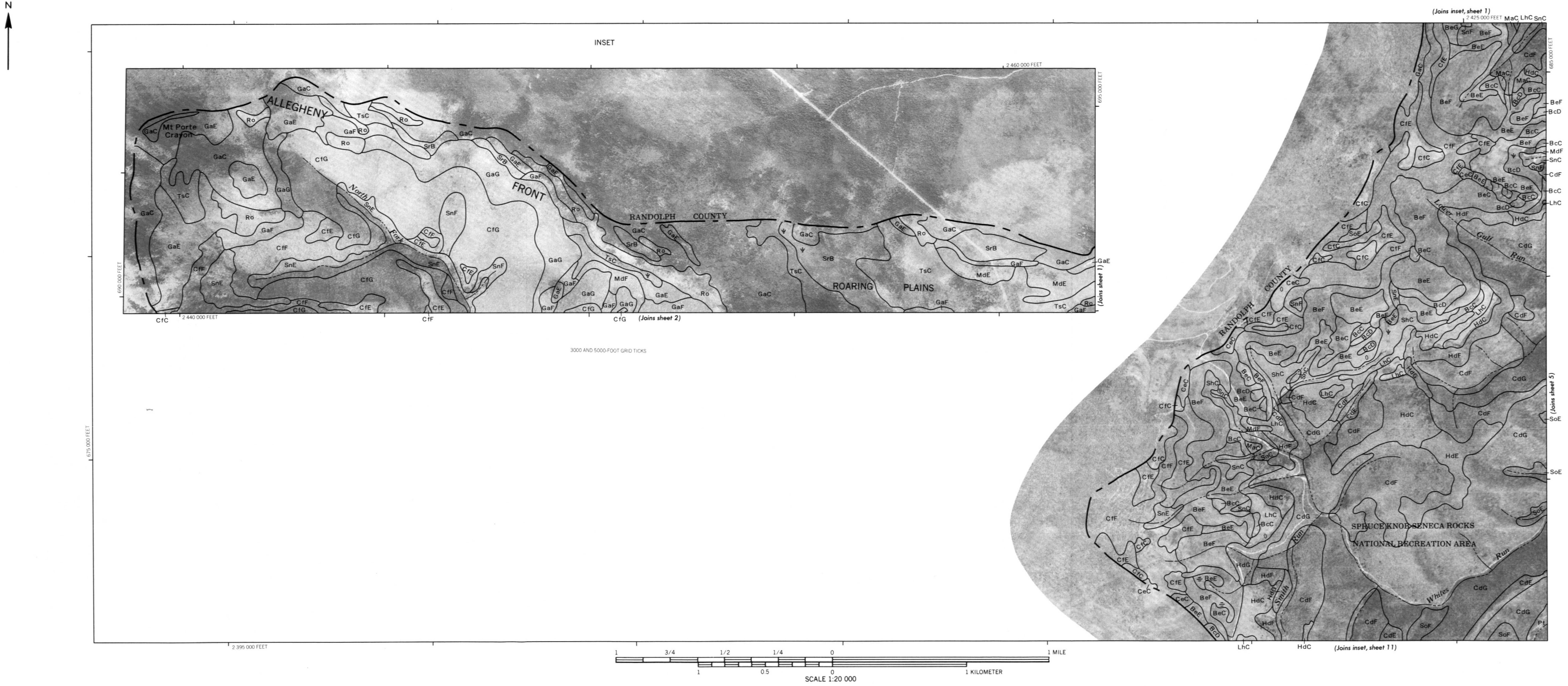

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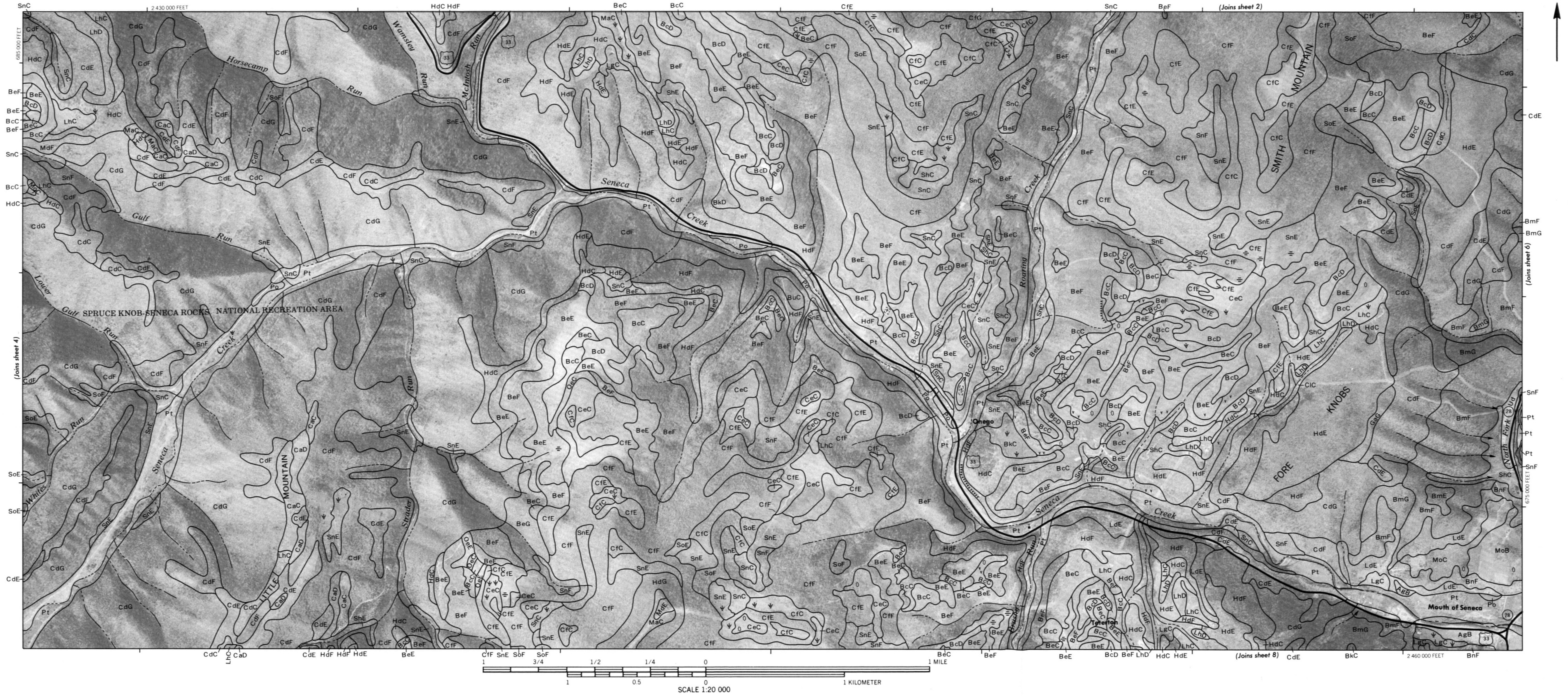

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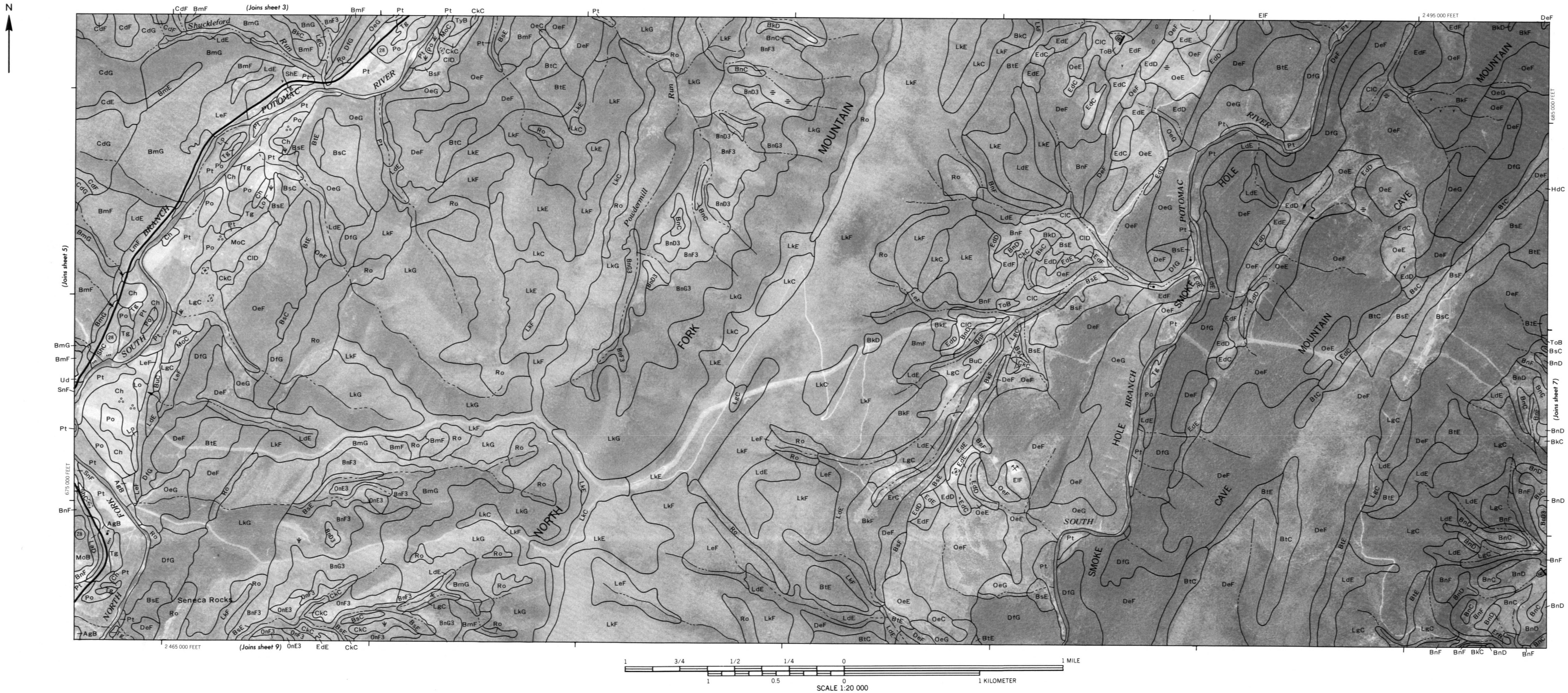

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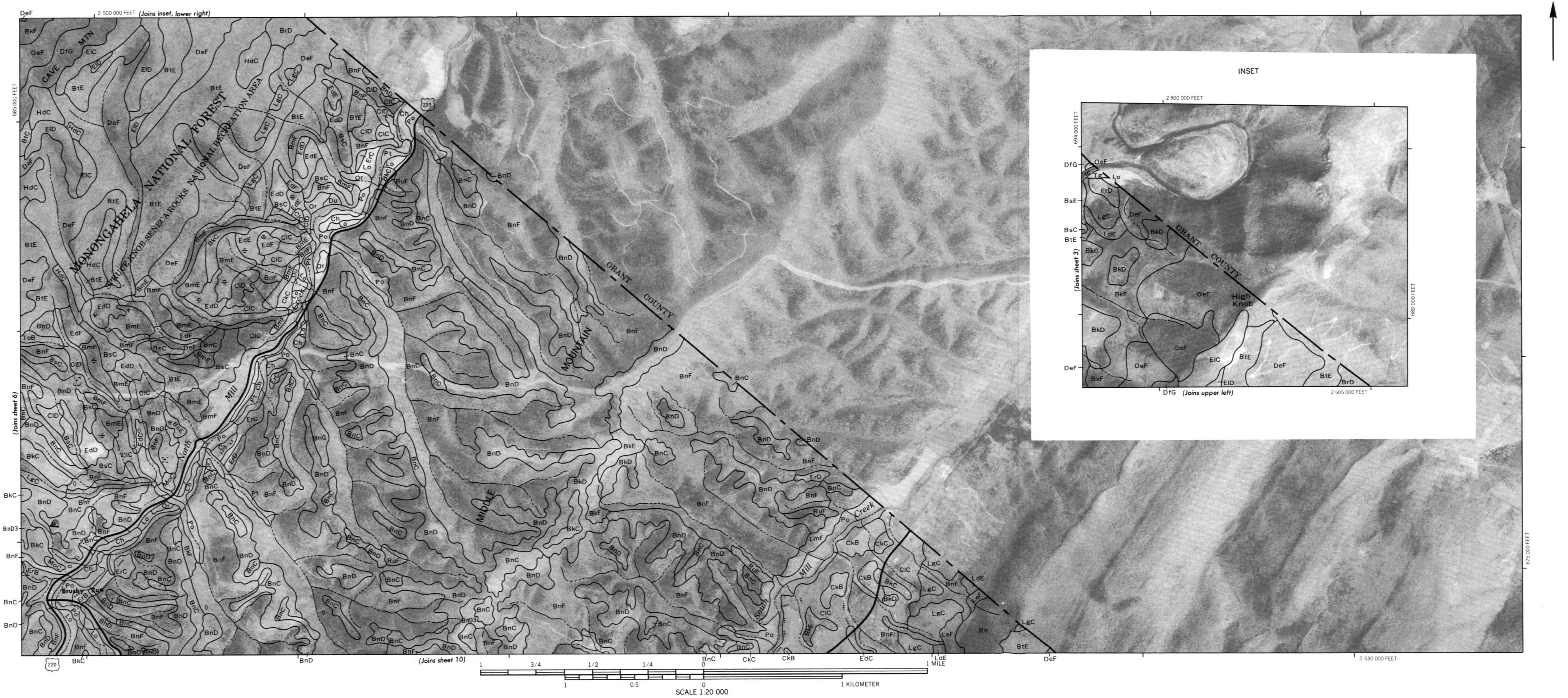

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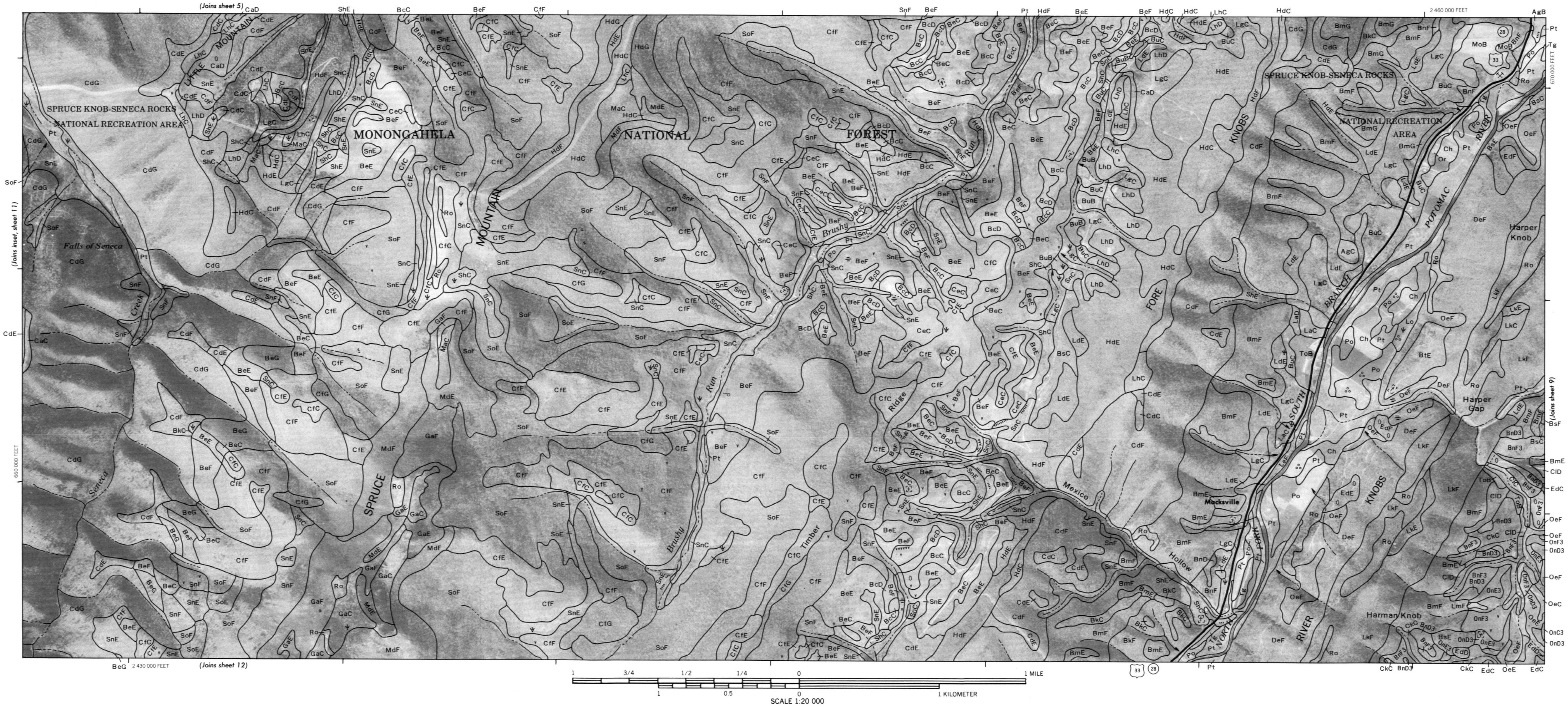
(Joins sheet 5)
(Joins inset, sheet 11)
(Joins sheet 9)
(Joins sheet 12)
SPRUCE KNOB-SENECA ROCKS NATIONAL RECREATION AREA
LITTLE MOUNTAIN
MONONGAHELA NATIONAL FOREST
SPRUCE MOUNTAIN
Falls of Seneca
Seneca Creek
Brushy Run
Timber Ridge
Mexico Hollow
FORE KNOBS
KNOBS
SOUTH BRANCH POTOMAC RIVER
NORTH FORK RIVER
Macksville
Harper Knob
Harper Gap
Harman Knob
2 460 000 FEET
670 000 FEET
660 000 FEET
2 430 000 FEET
33
28
1
3/4
1/2
1/4
0
1 MILE
0.5
1 KILOMETER
SCALE 1:20 000

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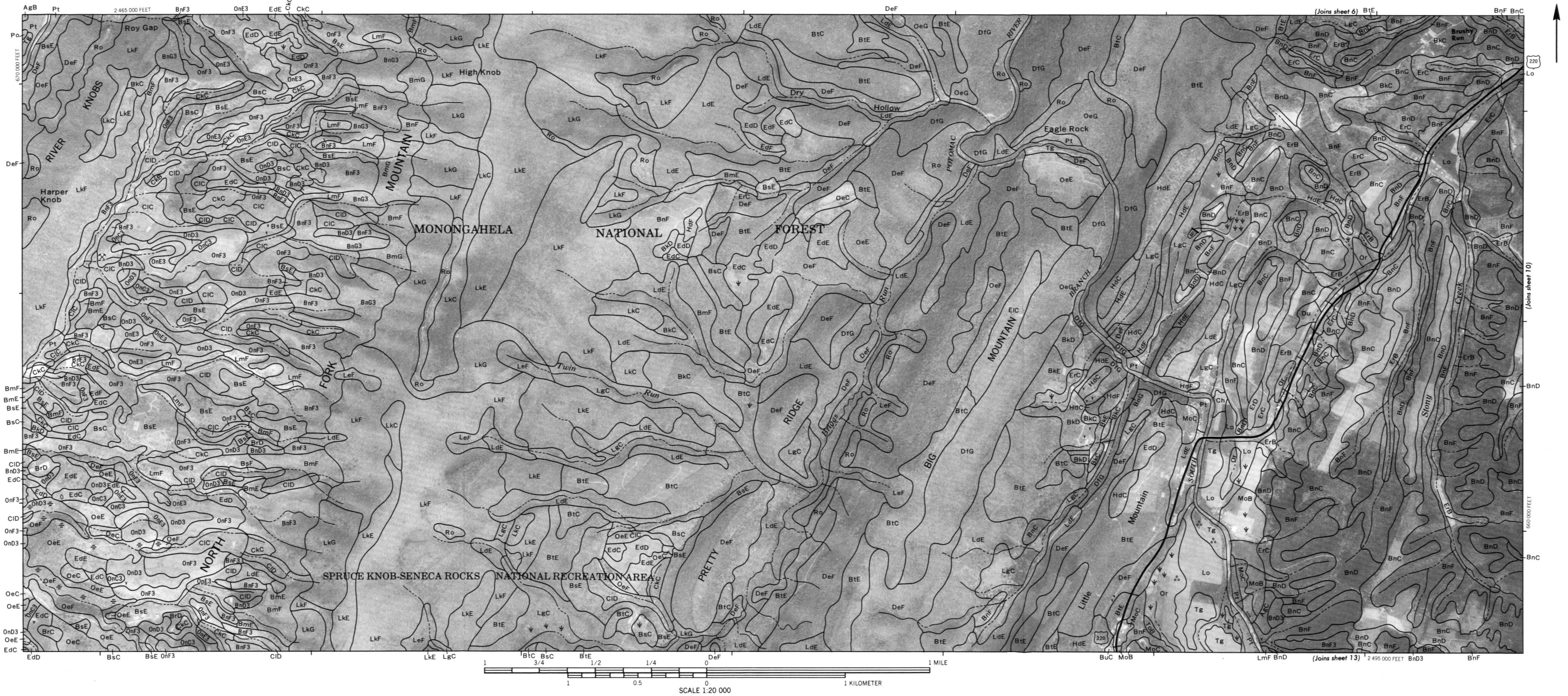
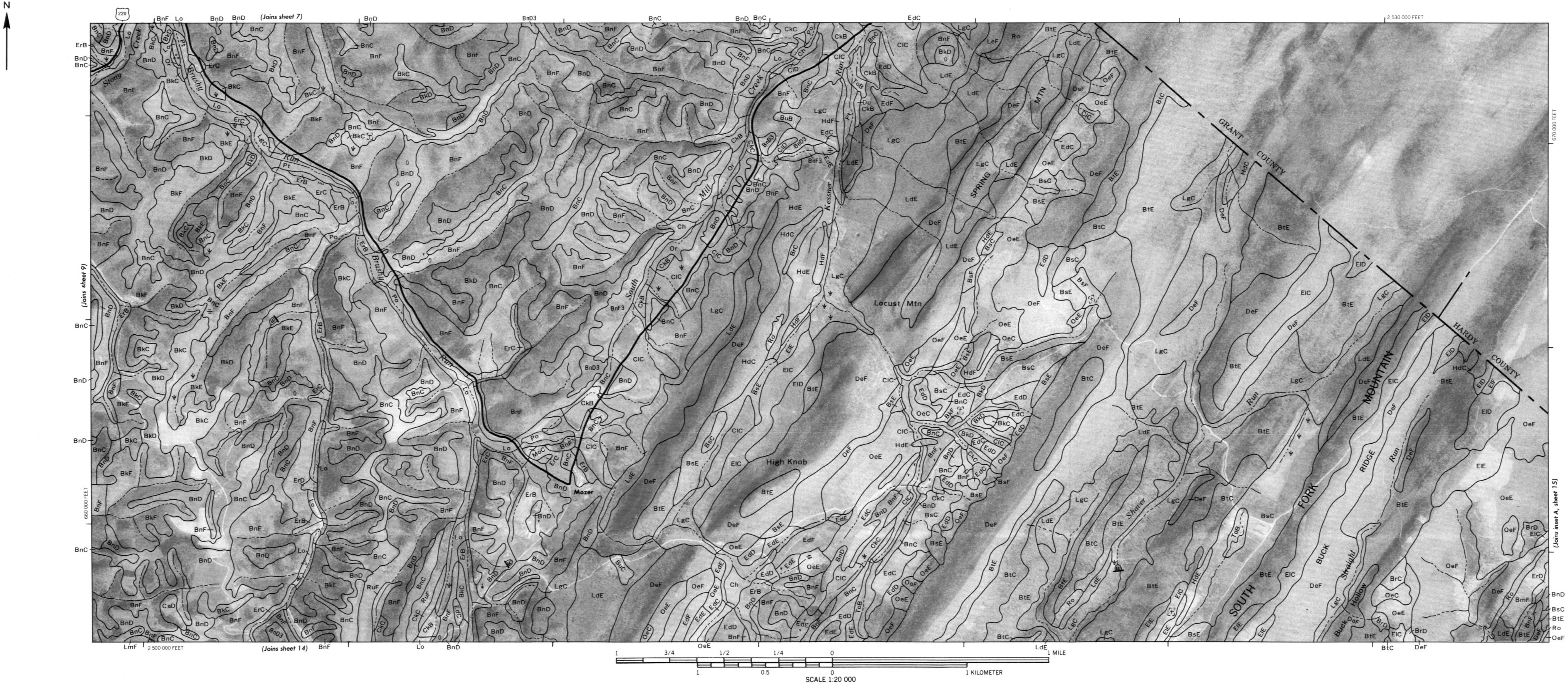
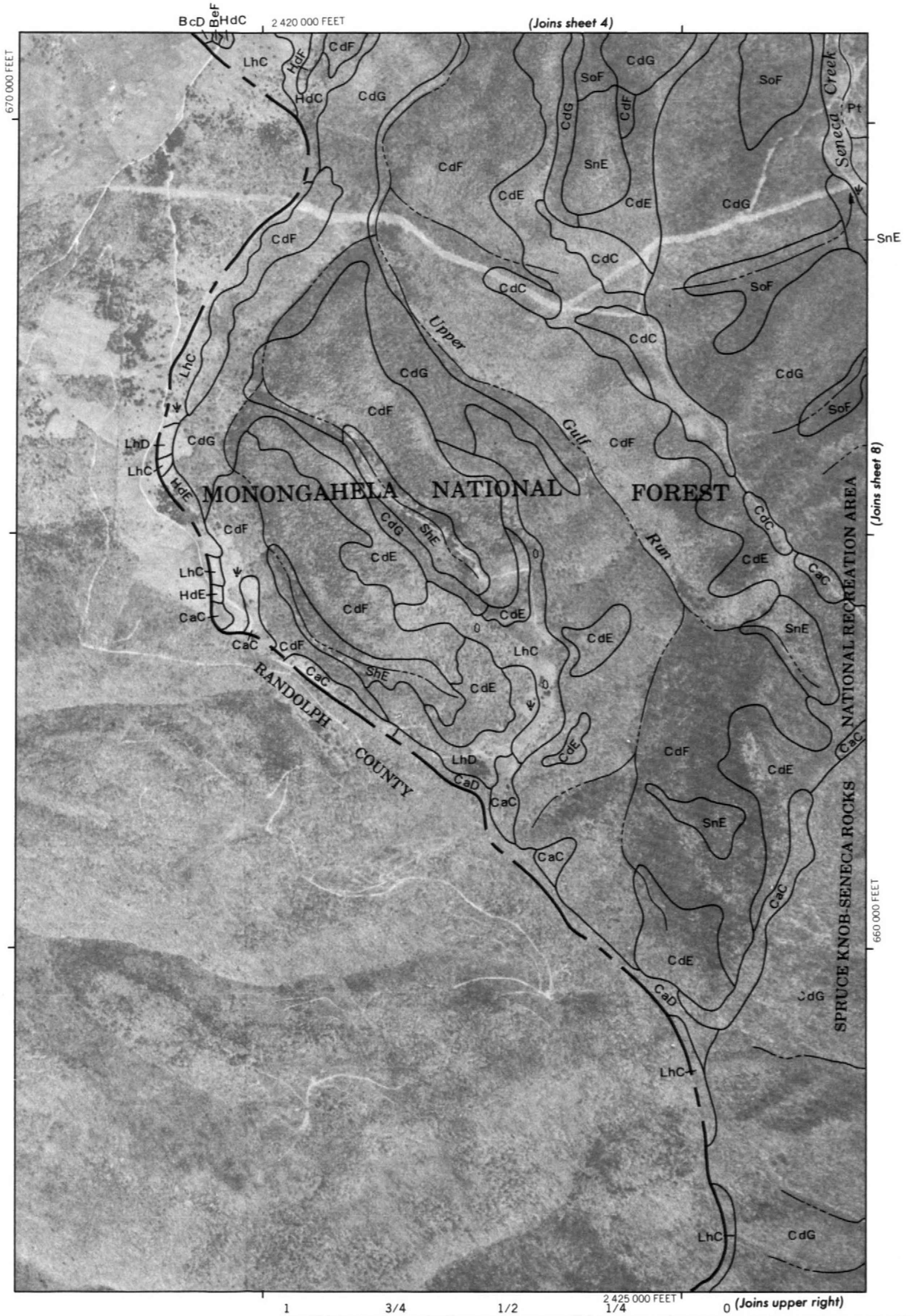
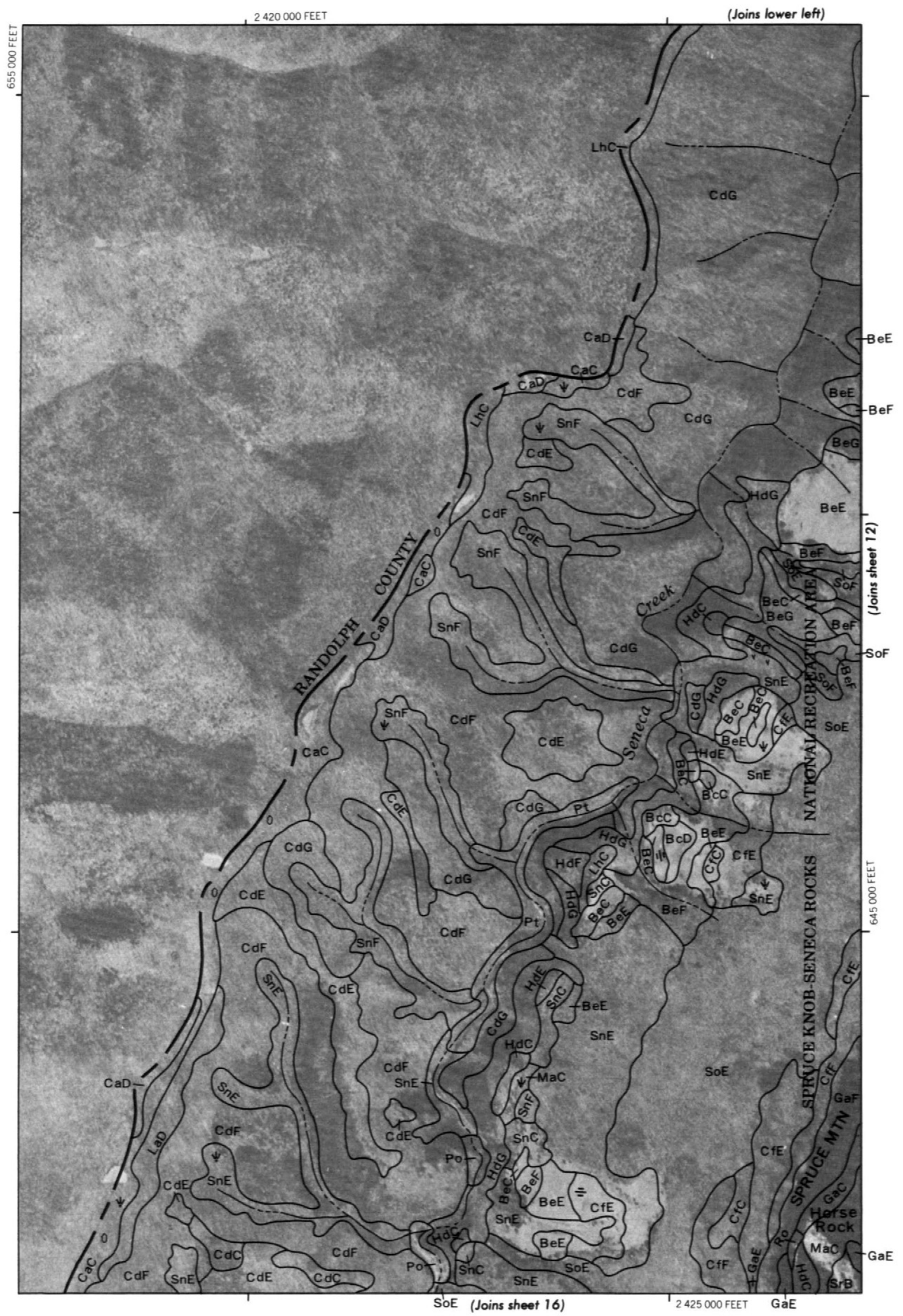



N
220
(Joins sheet 7)
(Joins sheet 9)
(Joins sheet 14)
(Joins inset A, sheet 15)
2 530 000 FEET
670 000 FEET
660 000 FEET
2 500 000 FEET
Stony Creek
Brushy Run
South Mill Creek
Kessner Run
SPRING MTN
Locust Mtn
High Knob
Mozer
GRANT COUNTY
HARDY COUNTY
SOUTH FORK MOUNTAIN
BUCK RIDGE
Run
Shaver Run
Straight Hollow
Buck Hollow
1
3/4
1/2
1/4
0
1 MILE
1
0.5
0
1 KILOMETER
SCALE 1:20 000

PENDLETON COUNTY, WEST VIRGINIA — SHEET NUMBER 11

INSET





11

N

1 3/4 1/2 1/4 0 1 MILE

1 0.5 0 1 KILOMETER

SCALE 1:20 000

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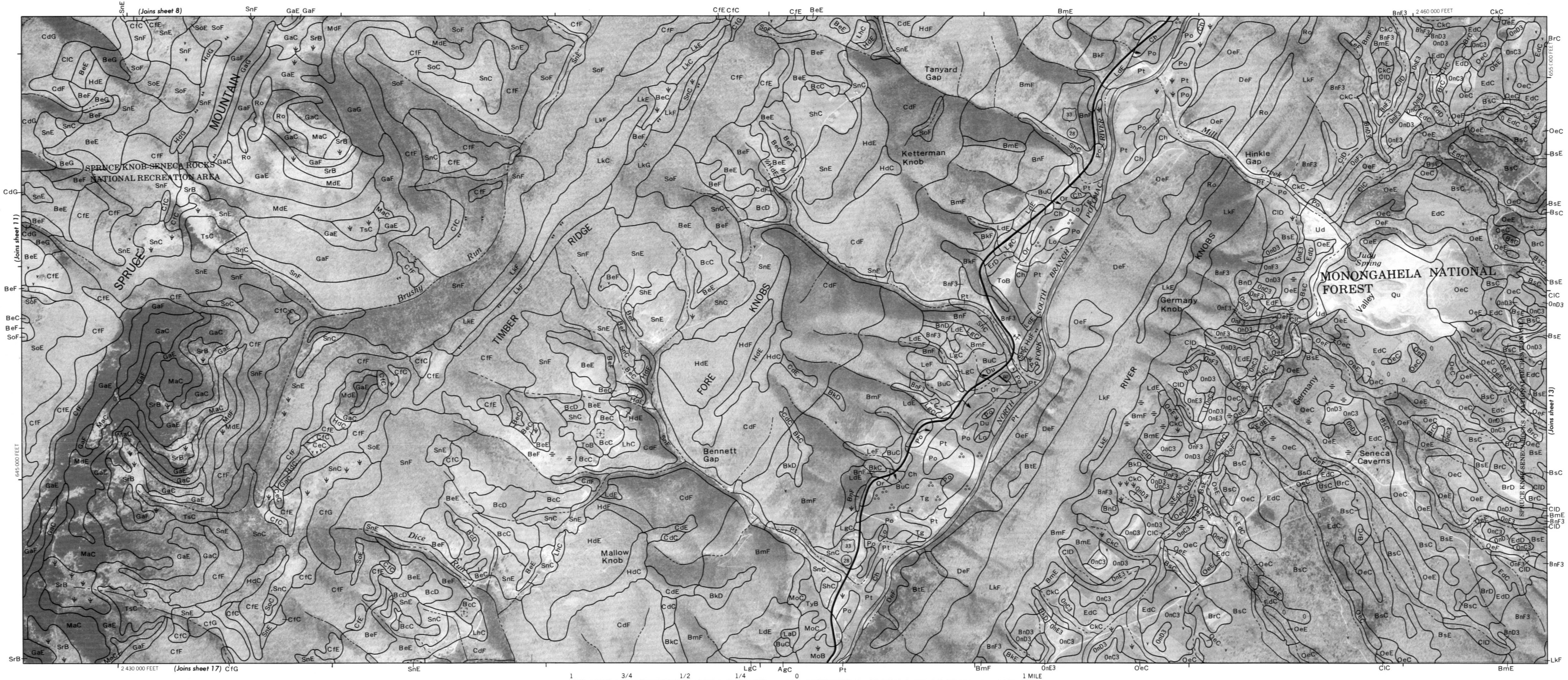

1 3/4 1/2 1/4 0 1 MILE

1 0.5 0 1 KILOMETER

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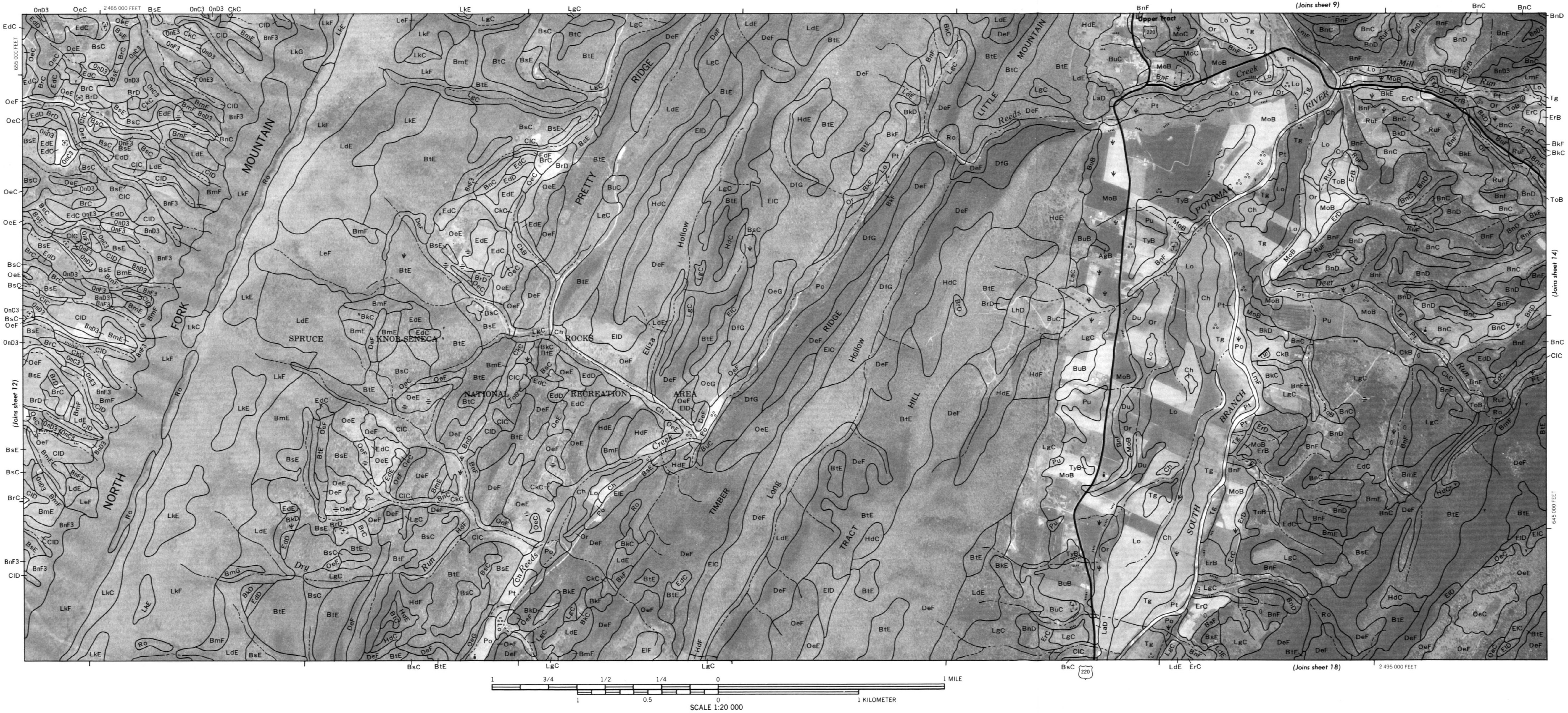

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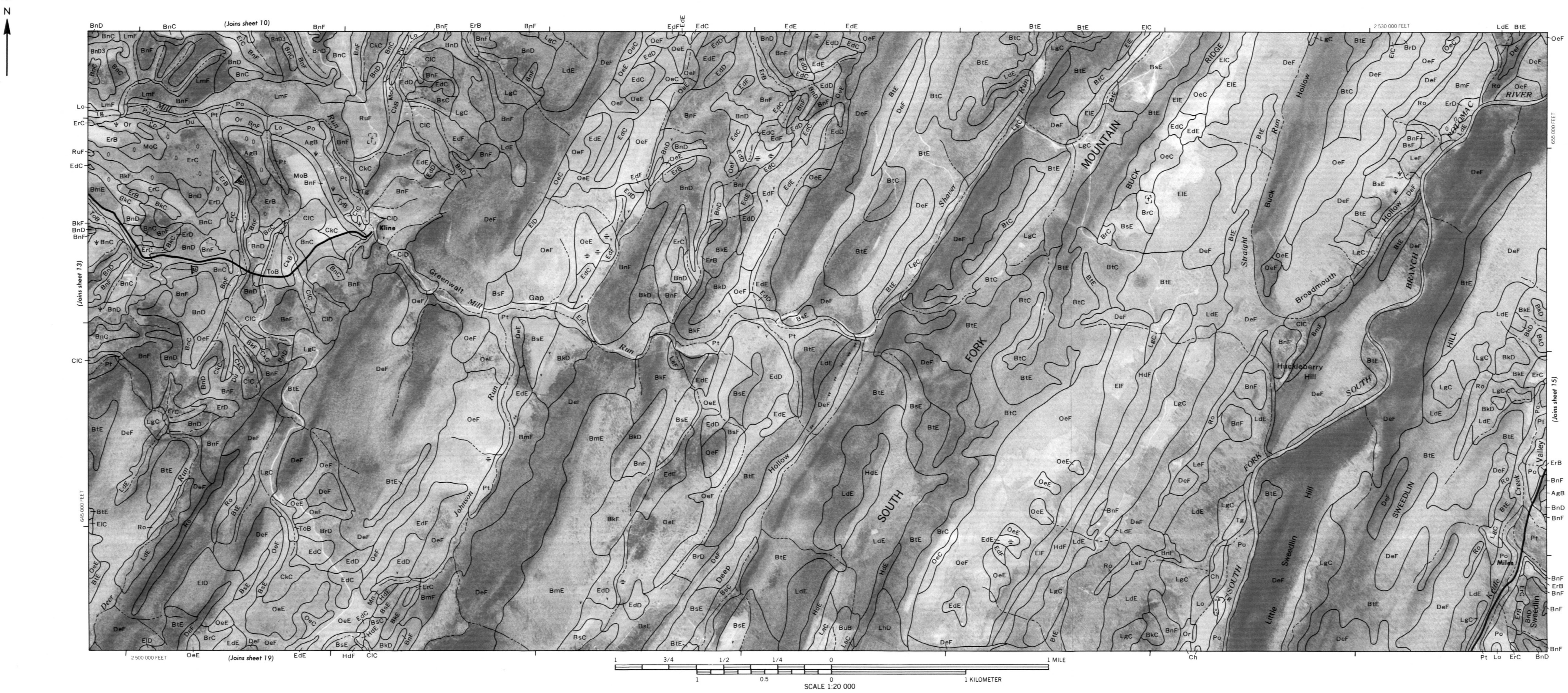
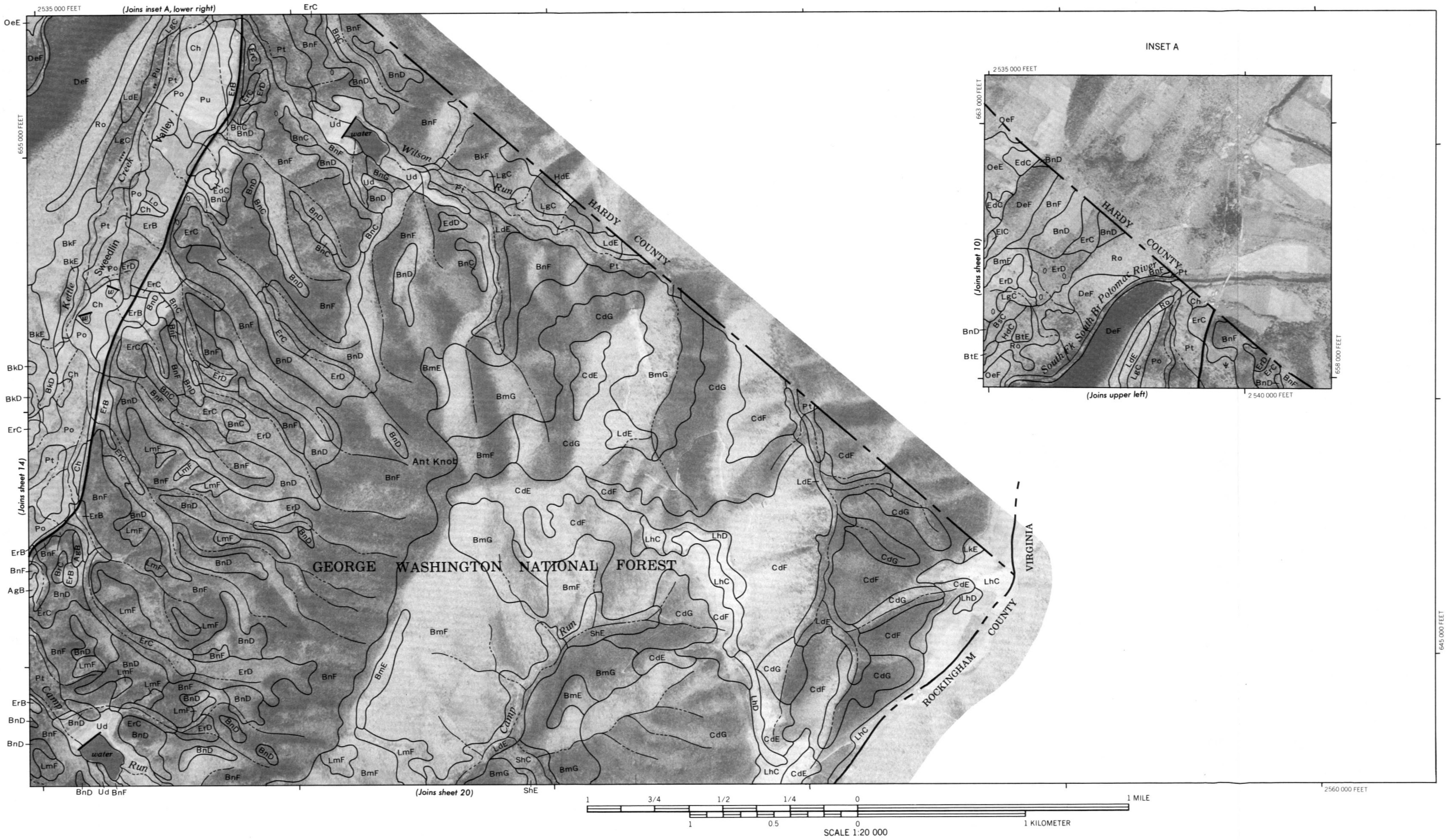
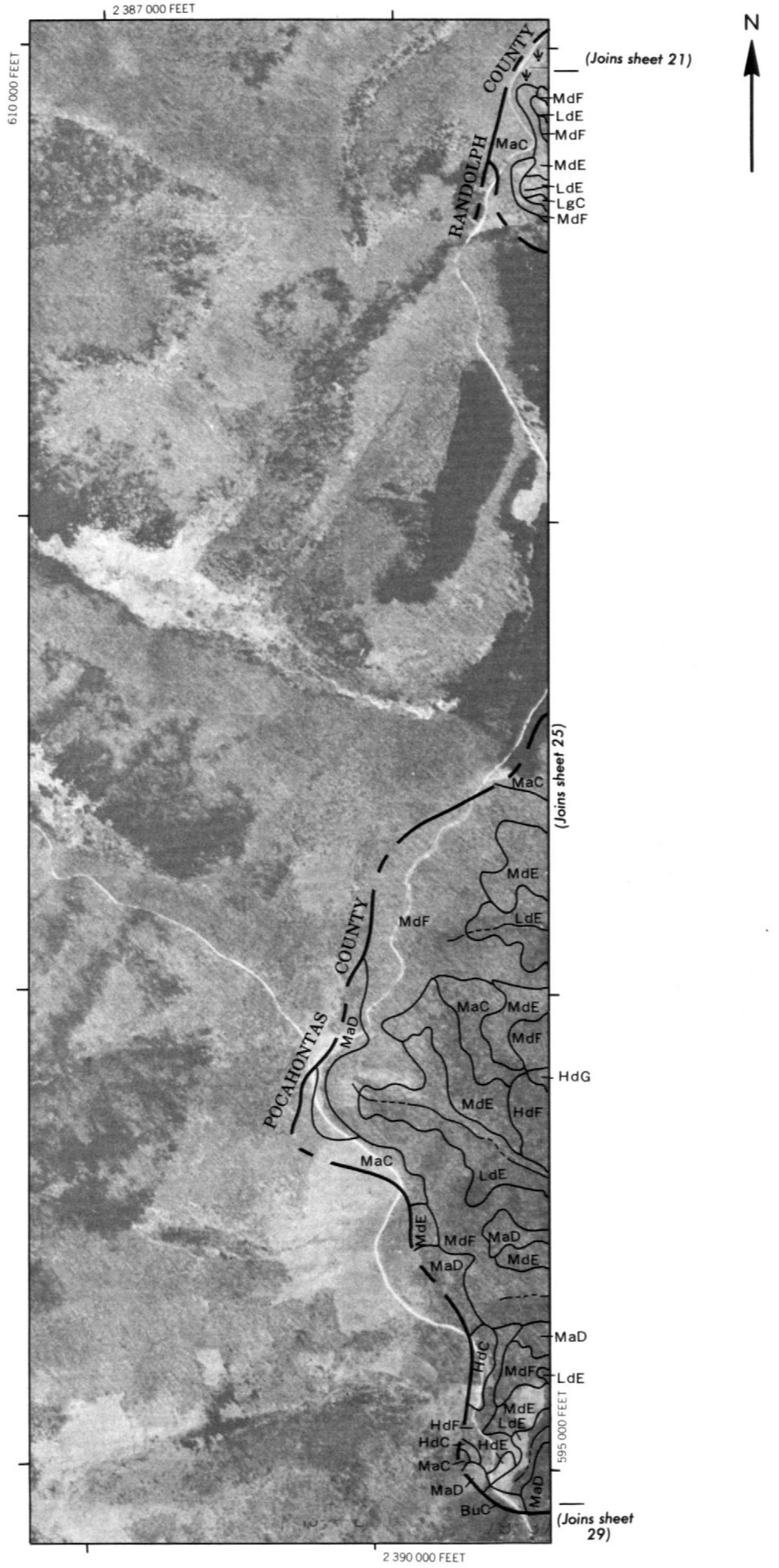




INSET B

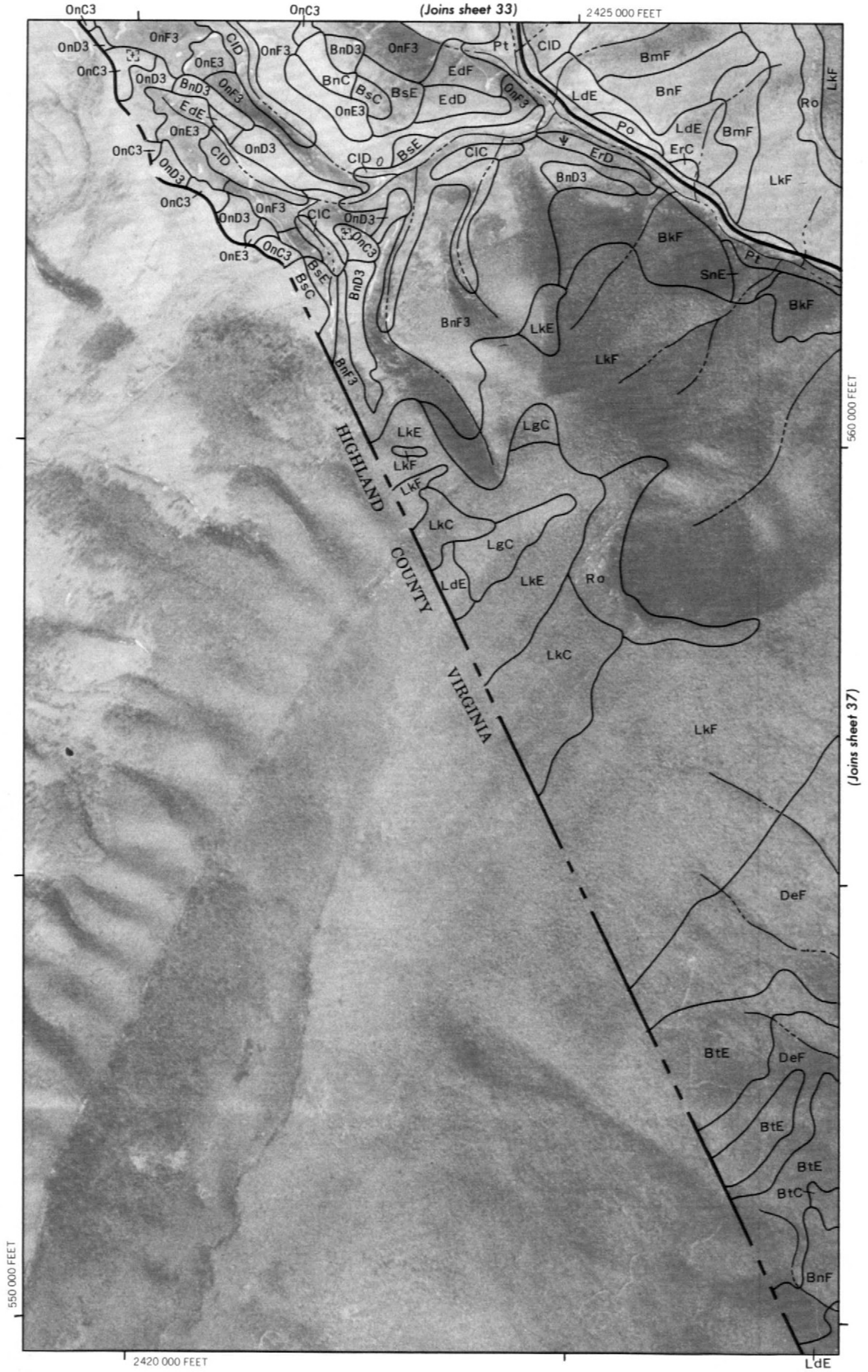


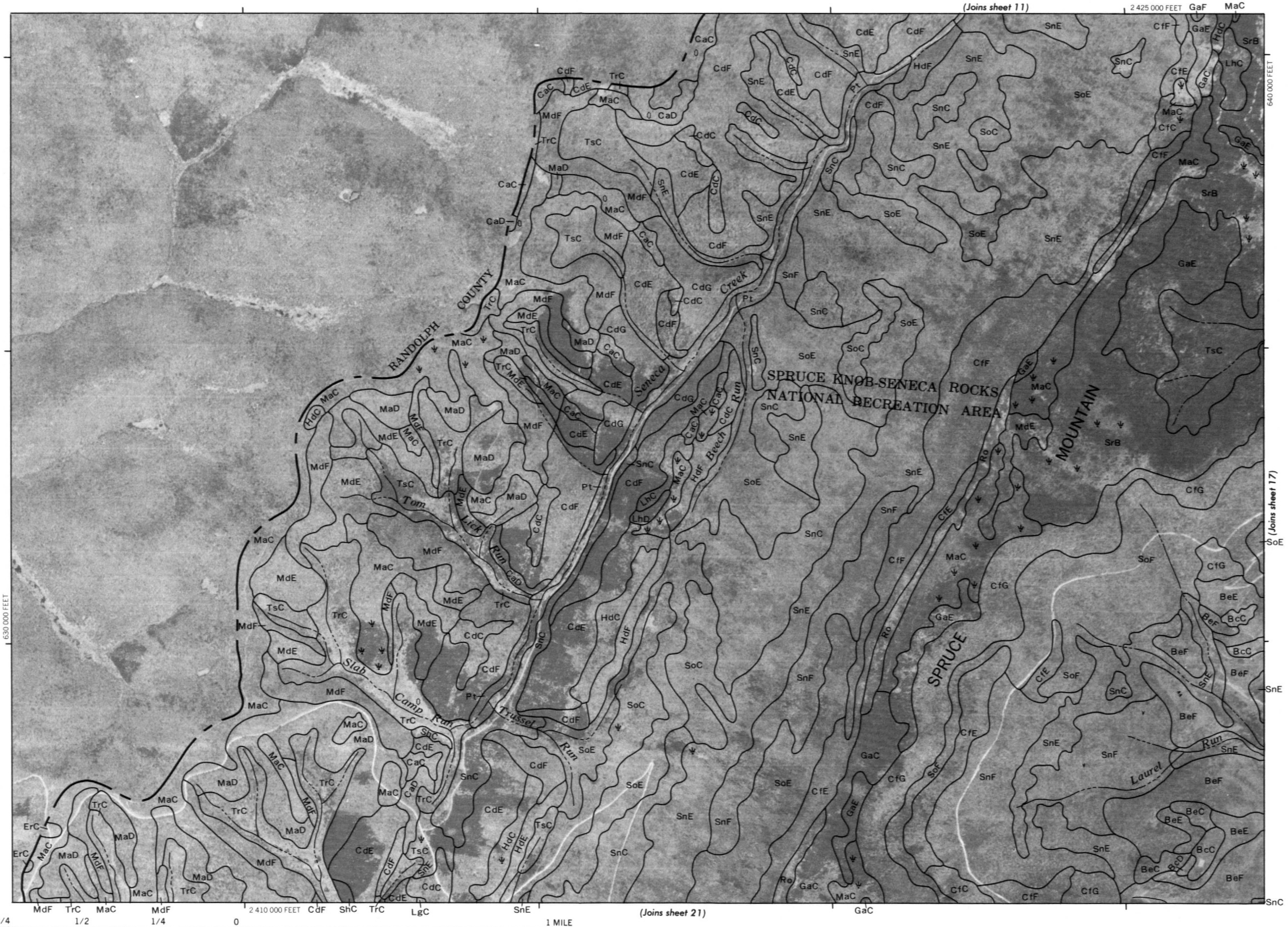
3000 AND 5000-FOOT GRID TICKS

N

INSET

PENDLETON COUNTY, WEST VIRGINIA — SHEET NUMBER 16

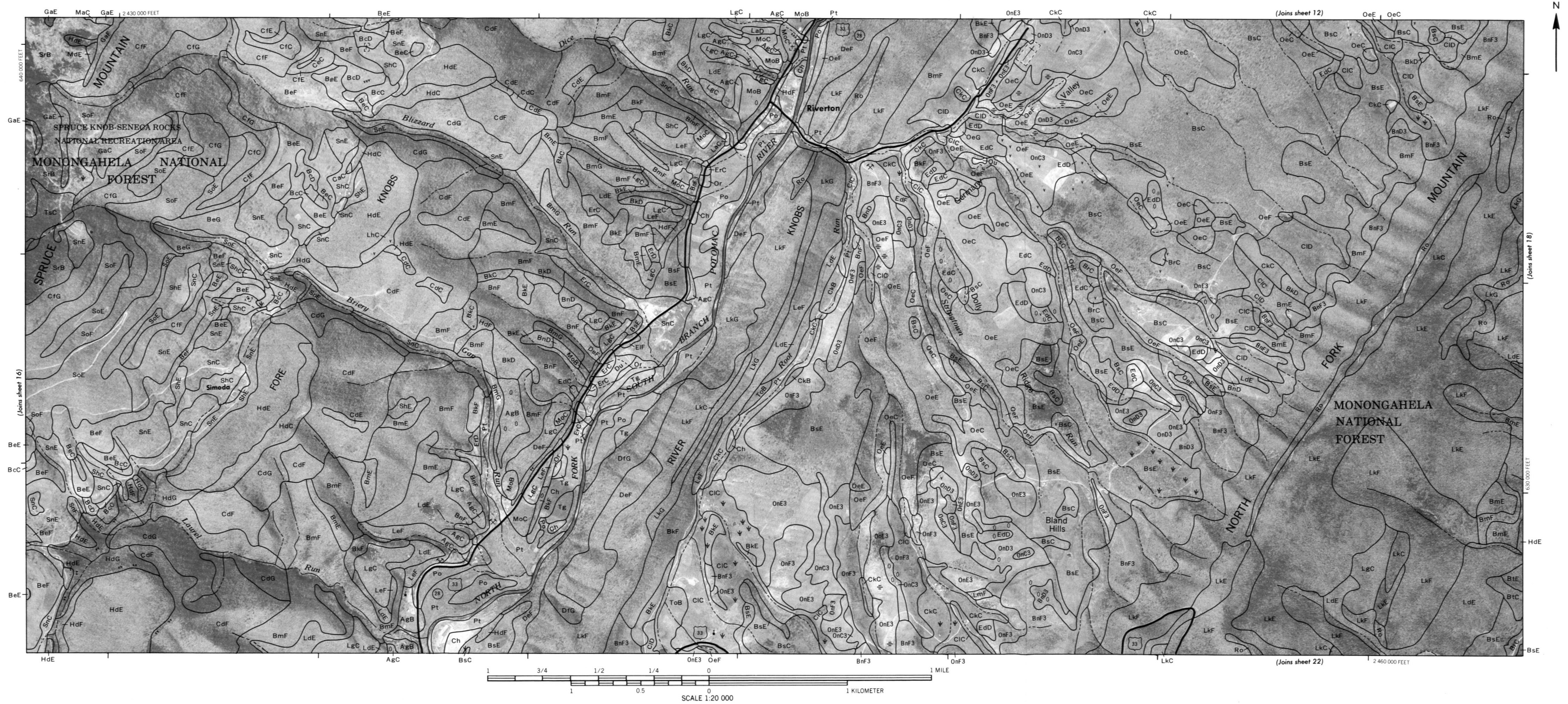


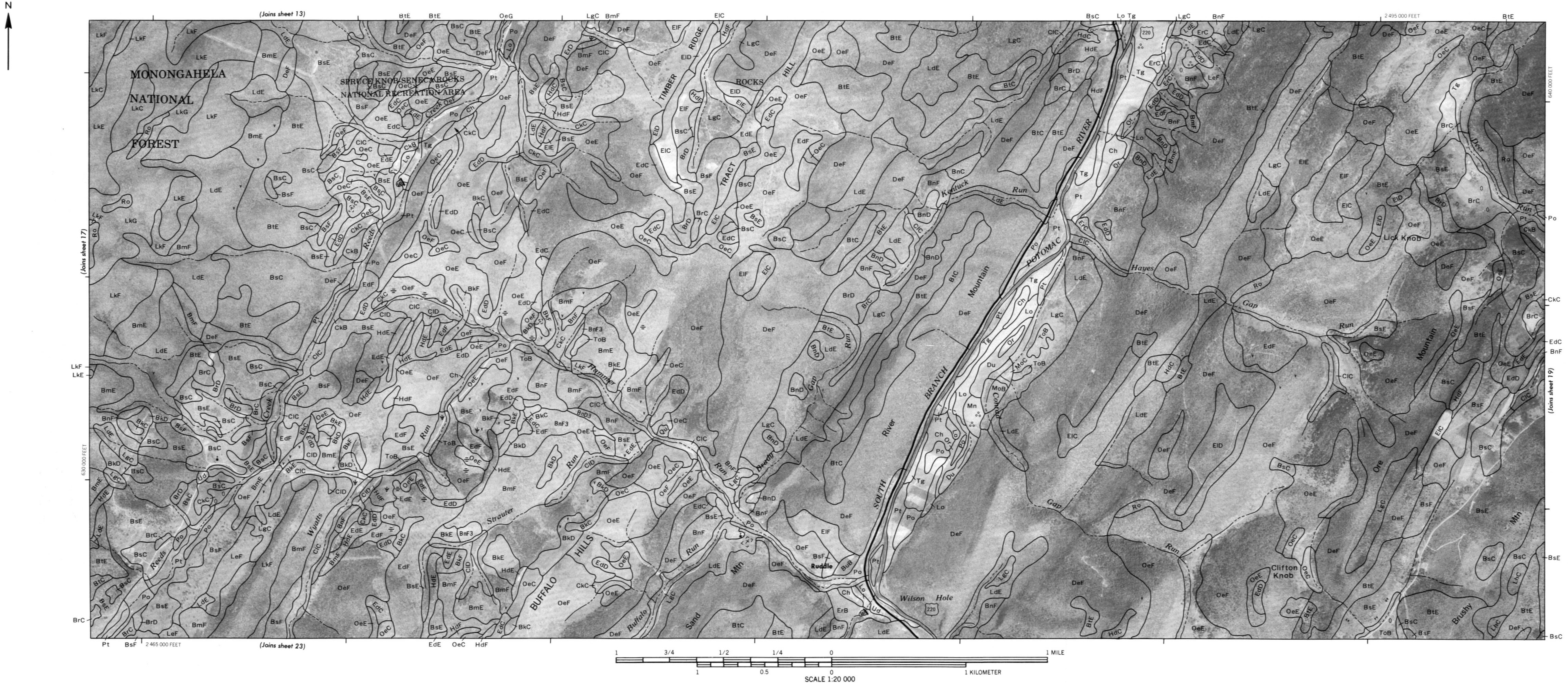


1 3/4 1/2 1/4 0 1 MILE

1 0.5 0 1 KILOMETER

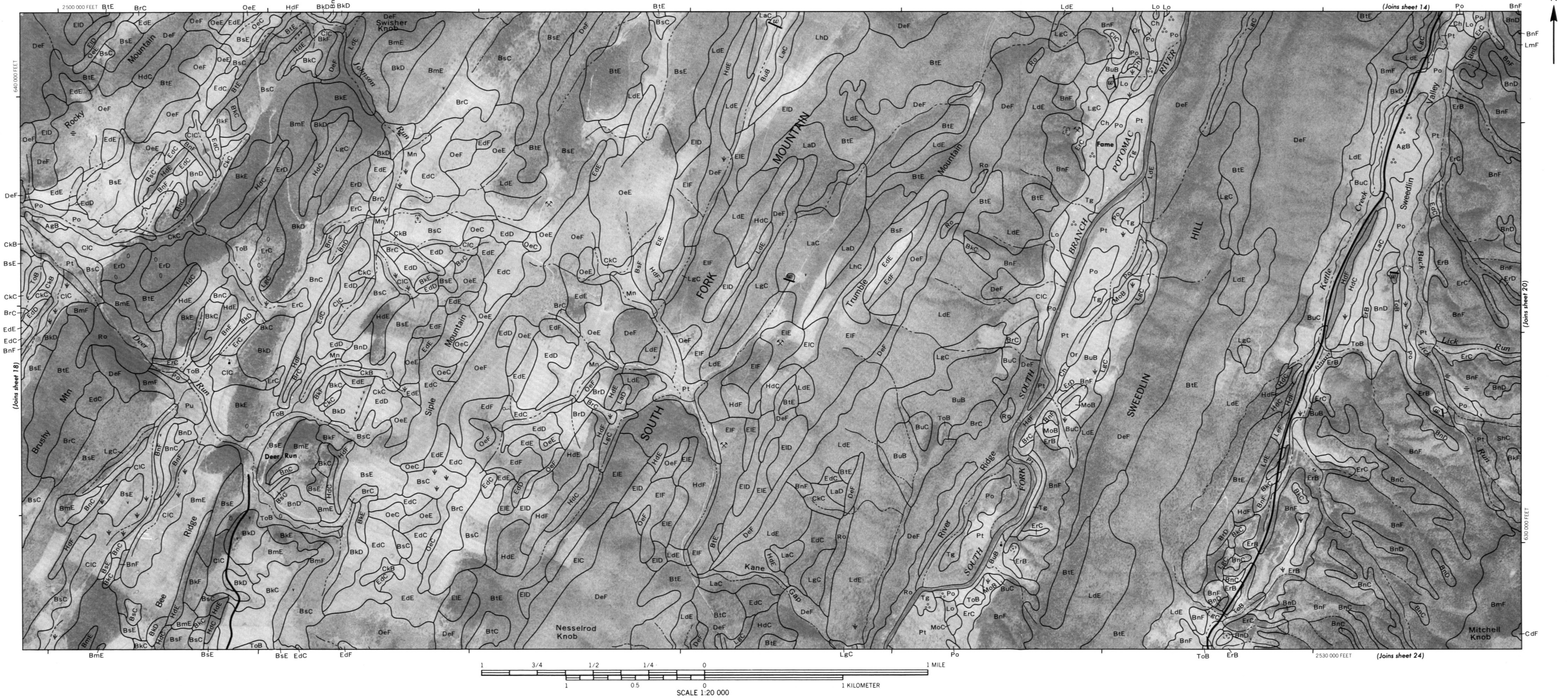
SCALE 1:20 000

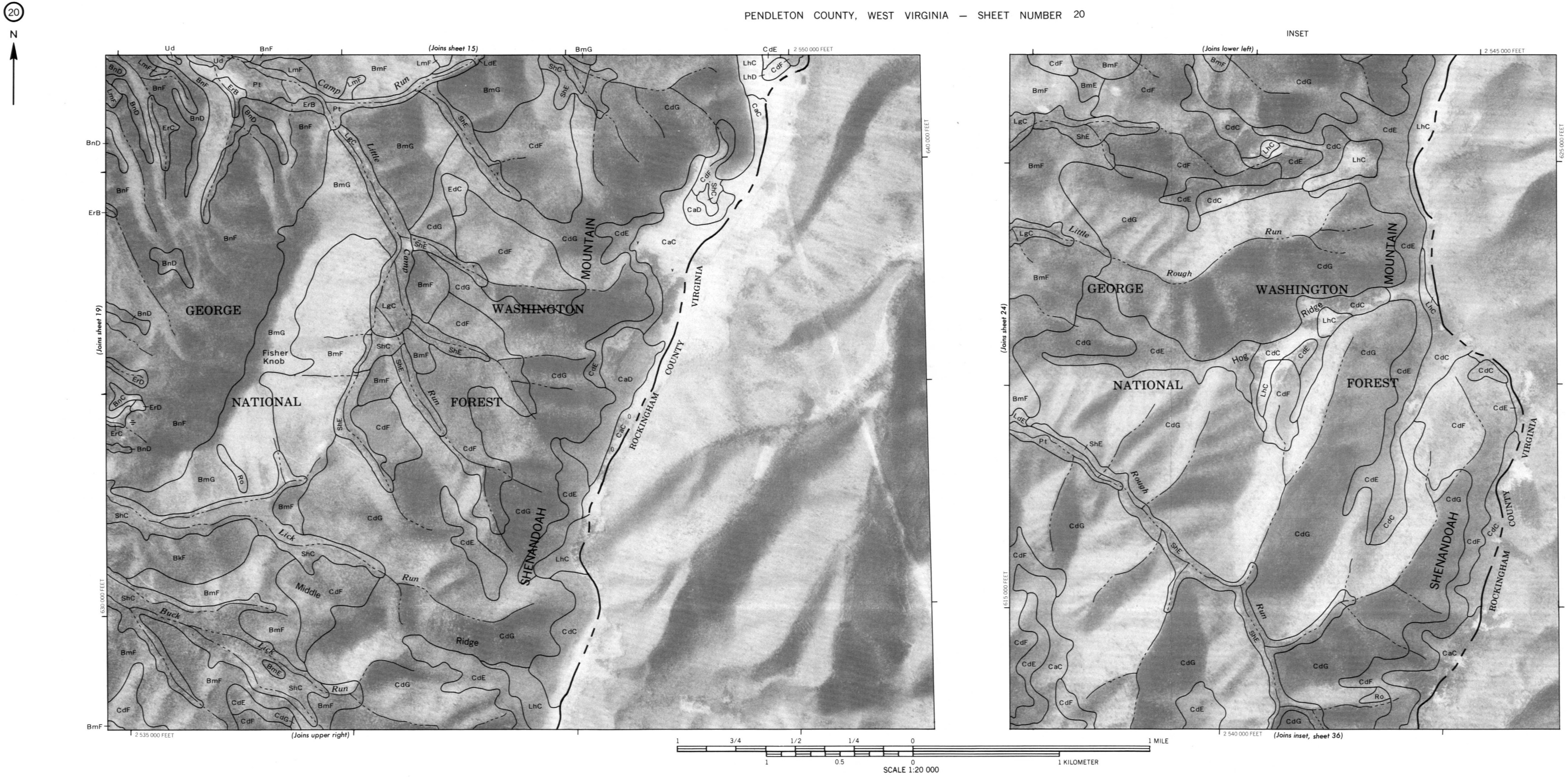

N
(Joins sheet 12)
(Joins sheet 16)
(Joins sheet 18)
(Joins sheet 22)
2 430 000 FEET
2 460 000 FEET
640 000 FEET
630 000 FEET
SPRUCE KNOB-SENECA ROCKS
NATIONAL RECREATION AREA
MONONGAHELA NATIONAL FOREST
SPRUCE
MOUNTAIN
KNOBS
FORE
Simoda
Dice Run
Blizzard Run
Briery Gap Run
Laurel Run
Riverton
POTOMAC RIVER
SOUTH BRANCH
SOUTH FORK
NORTH FORK
RIVER
KNOBS
Root Run
Germany Valley
Dolly Ridge
Shreve Run
Bland Hills
NORTH FORK MOUNTAIN
MONONGAHELA NATIONAL FOREST
28
33
1 MILE
3/4
1/2
1/4
0
1
1 KILOMETER
0.5
SCALE 1:20 000


N
(Joins sheet 13)
(Joins sheet 17)
(Joins sheet 19)
(Joins sheet 23)
MONONGAHELA NATIONAL FOREST
SPRUCE KNOB-SENECA ROCKS NATIONAL RECREATION AREA
TIMBER RIDGE
ROCKS HILL TRACT
Reeds Creek
Kentuck Run
POTOMAC RIVER
SOUTH BRANCH
Hayes Gap Run
Lick Knob
Ore Mountain
Mountain
River Mountain
Gap Run
Brady Run
Hammer Run
Strouter
Wyatts
BUFFALO HILLS
Buffalo
Sand Mtn
Ruddle
Wilson Hole
Clifton Knob
Brushy Mtn
Conrad
Deer Run
220
2 495 000 FEET
640 000 FEET
630 000 FEET
2 465 000 FEET
1 3/4 1/2 1/4 0 1 MILE
1 0.5 0 1 KILOMETER
SCALE 1:20 000

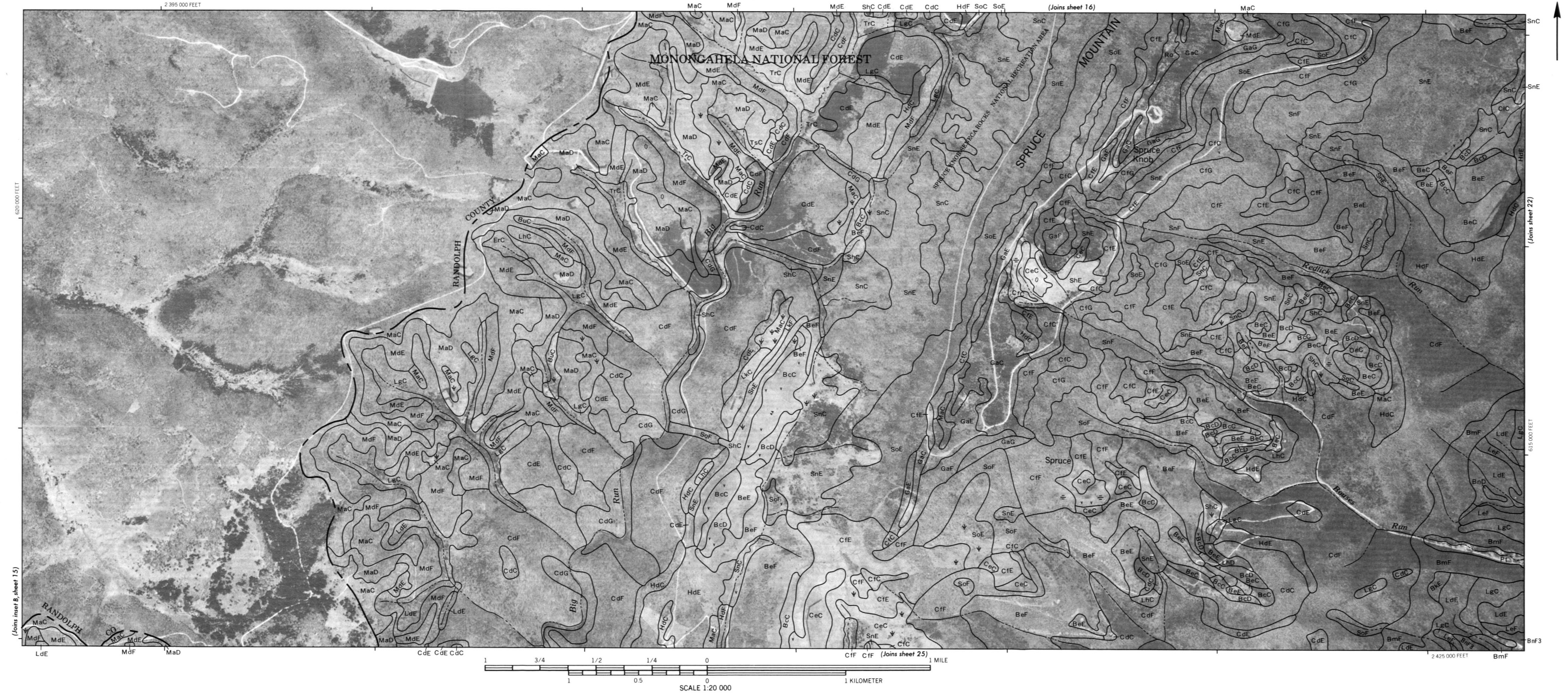
PENDLETON COUNTY, WEST VIRGINIA — SHEET NUMBER 19

⑲




20
N
INSET
(Joins sheet 15)
(Joins sheet 19)
(Joins upper right)
(Joins lower left)
(Joins sheet 24)
(Joins inset, sheet 36)
2 550 000 FEET
640 000 FEET
630 000 FEET
2 535 000 FEET
2 545 000 FEET
625 000 FEET
615 000 FEET
2 540 000 FEET
GEORGE
WASHINGTON
NATIONAL
FOREST
MOUNTAIN
SHENANDOAH
VIRGINIA
ROCKINGHAM
COUNTY
Fisher Knob
Camp Run
Little Camp Run
Lick Run
Middle Ridge
Buck Lick Run
Little Rough Run
Rough Run
Hog Ridge
Ud
BnF
BmG
CdE
LhC
LhD
CdF
LmF
BmF
LdE
ShC
ShE
BnD
ErB
Pt
ErC
LgC
CdG
EdC
CaC
CaD
CdC
BkF
BmE
Ro
LmE
BnC
ErD
1
3/4
1/2
1/4
0
1 MILE
0.5
1 KILOMETER
SCALE 1:20 000

PENDLETON COUNTY, WEST VIRGINIA — SHEET NUMBER 21



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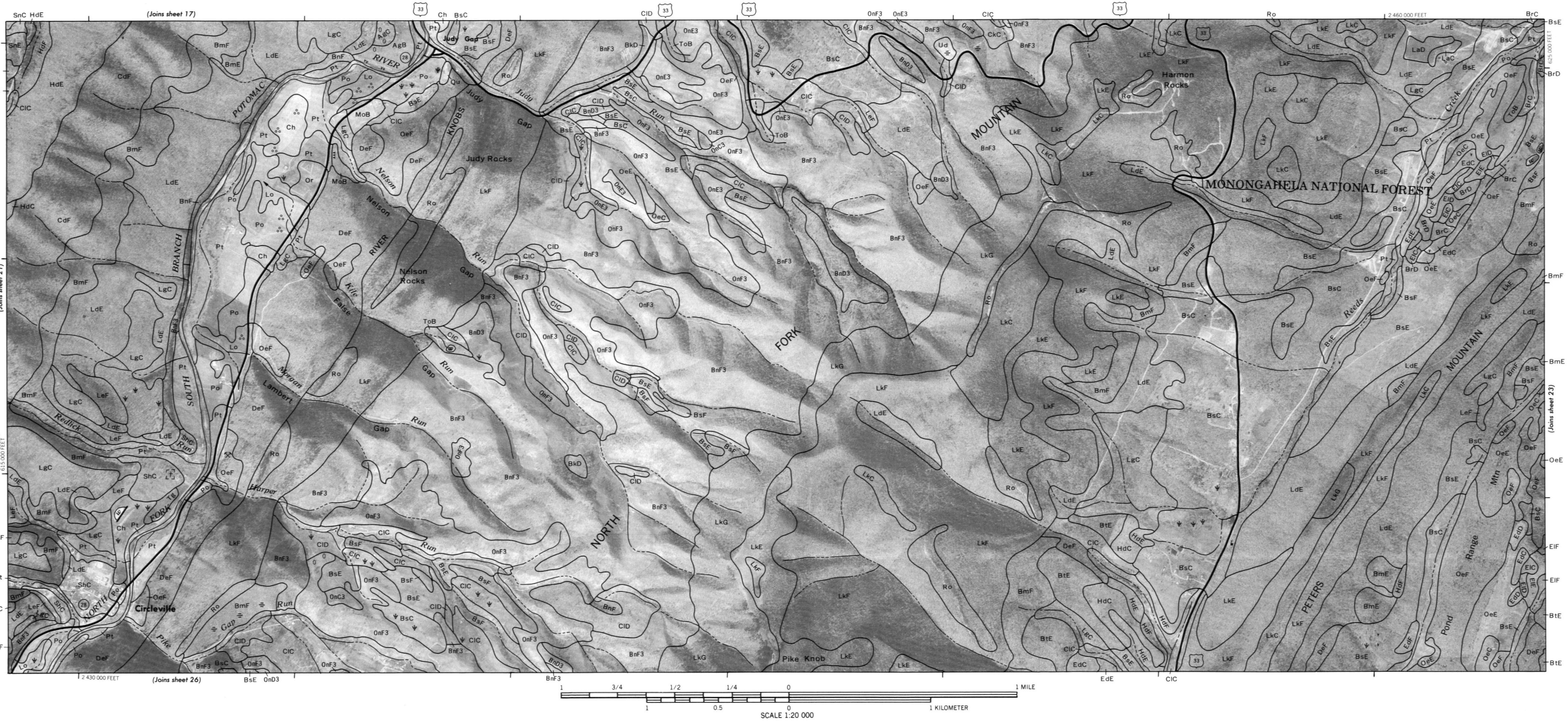
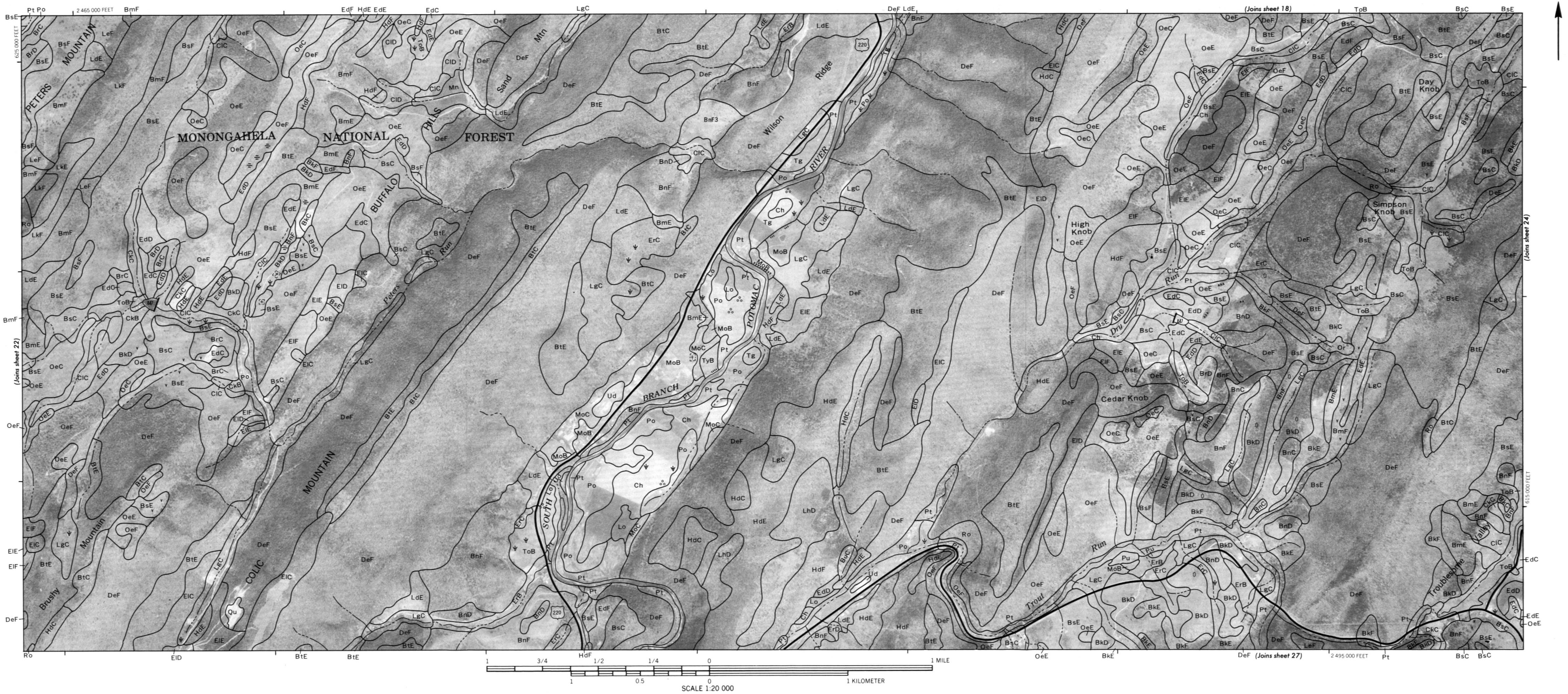
PENDLETON COUNTY, WEST VIRGINIA — SHEET NUMBER 22

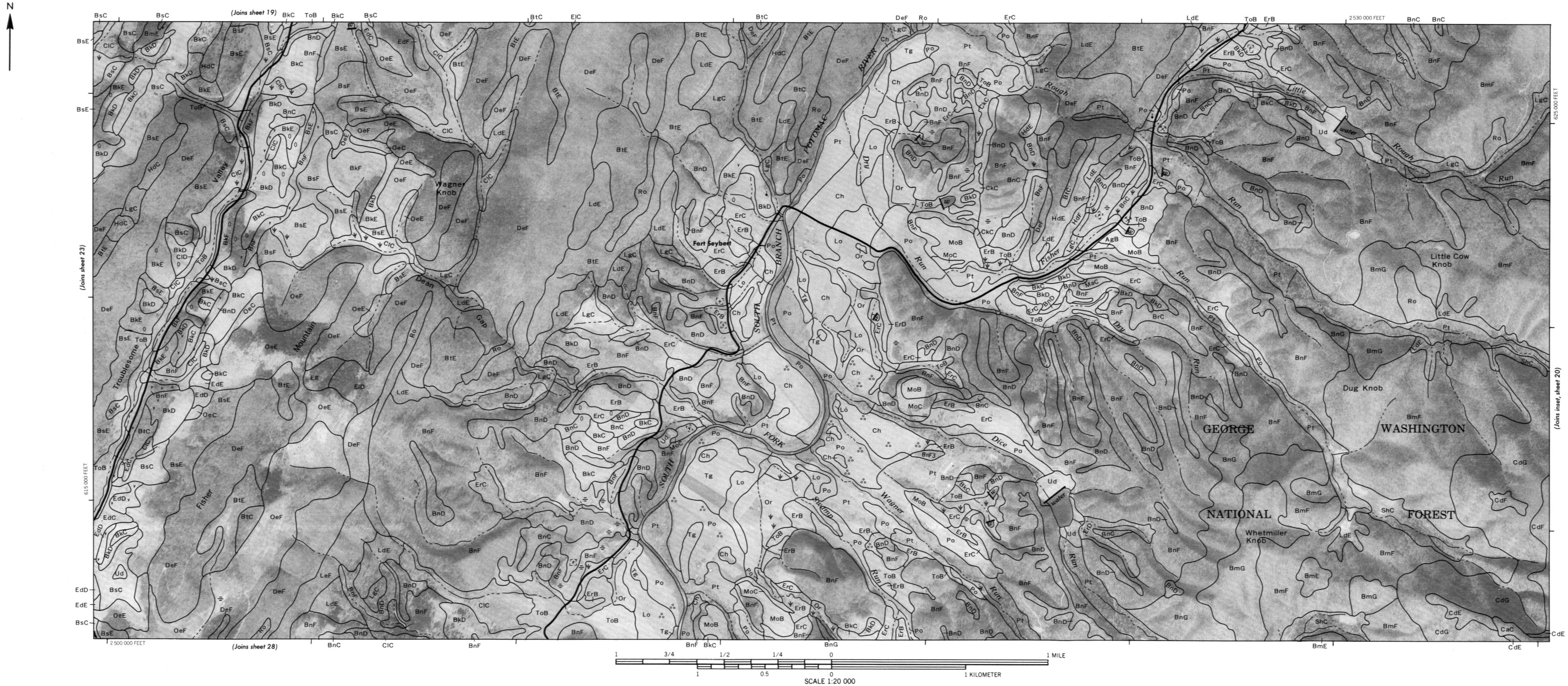


PENDLETON COUNTY, WEST VIRGINIA — SHEET NUMBER 23

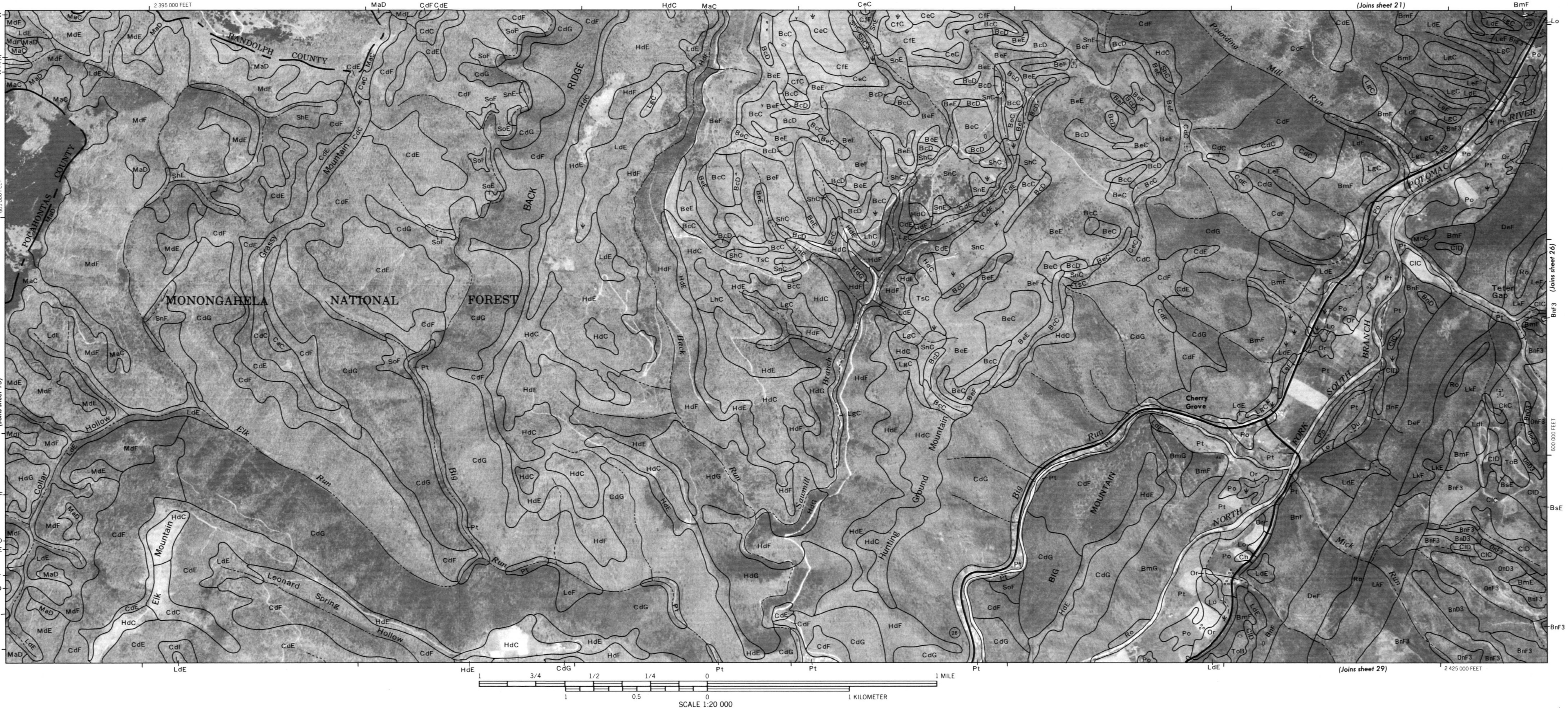


24

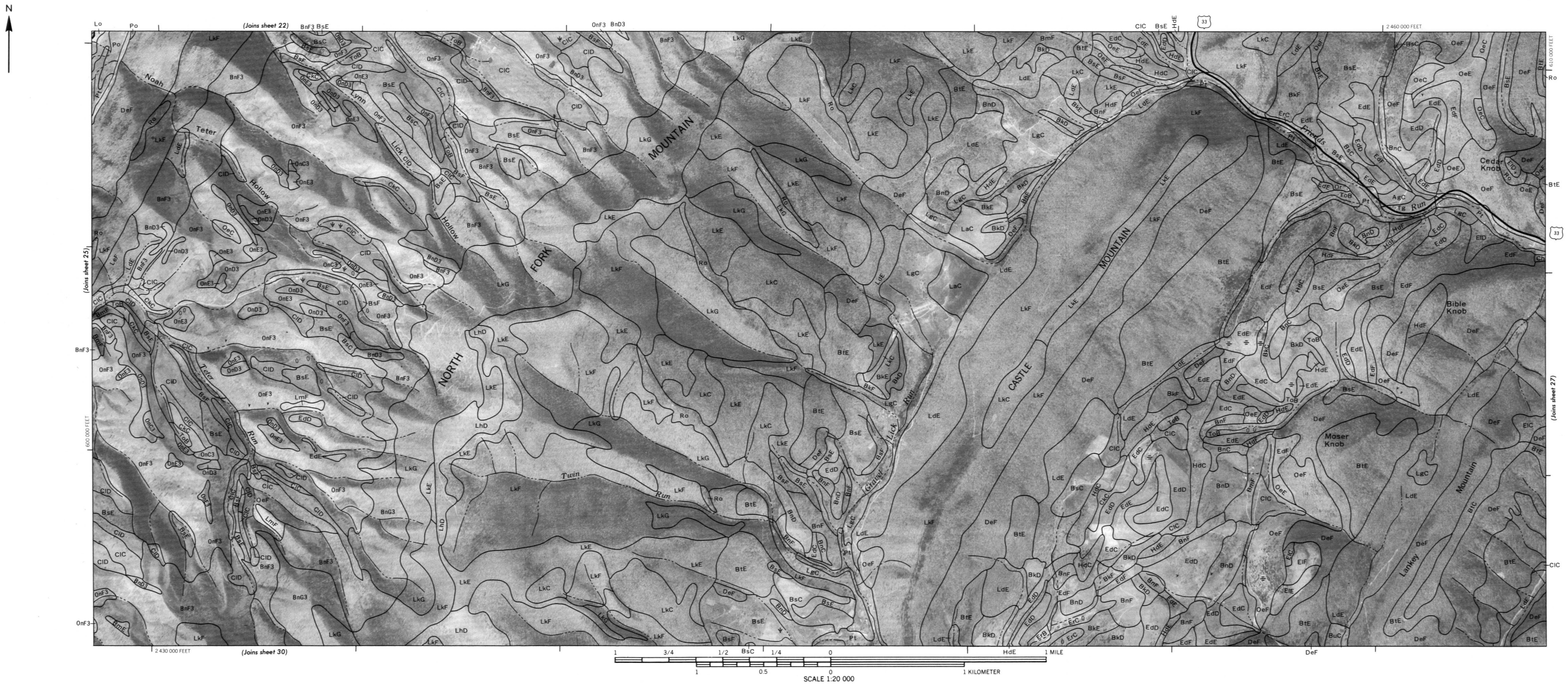
PENDLETON COUNTY, WEST VIRGINIA — SHEET NUMBER 24



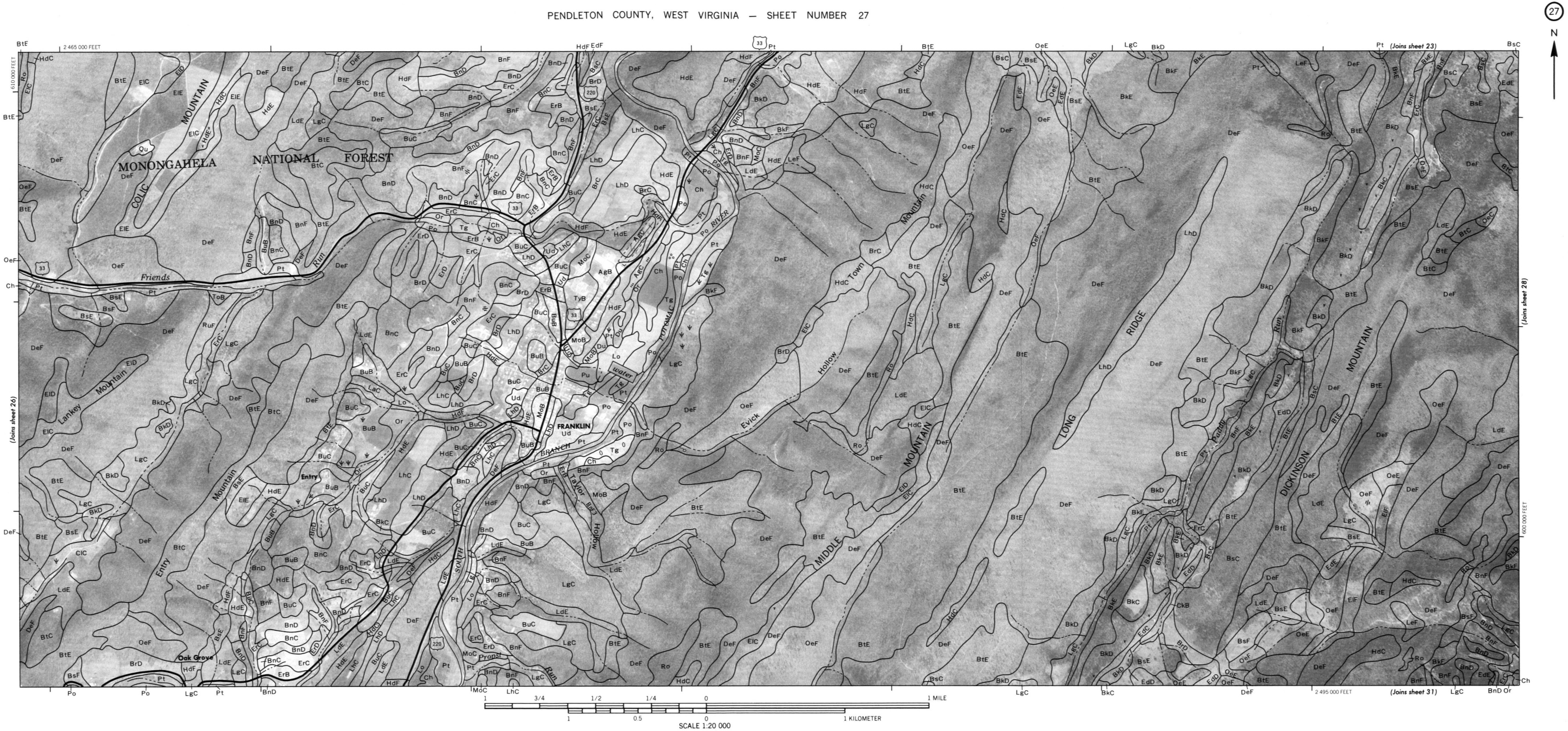
PENDLETON COUNTY, WEST VIRGINIA — SHEET NUMBER 25

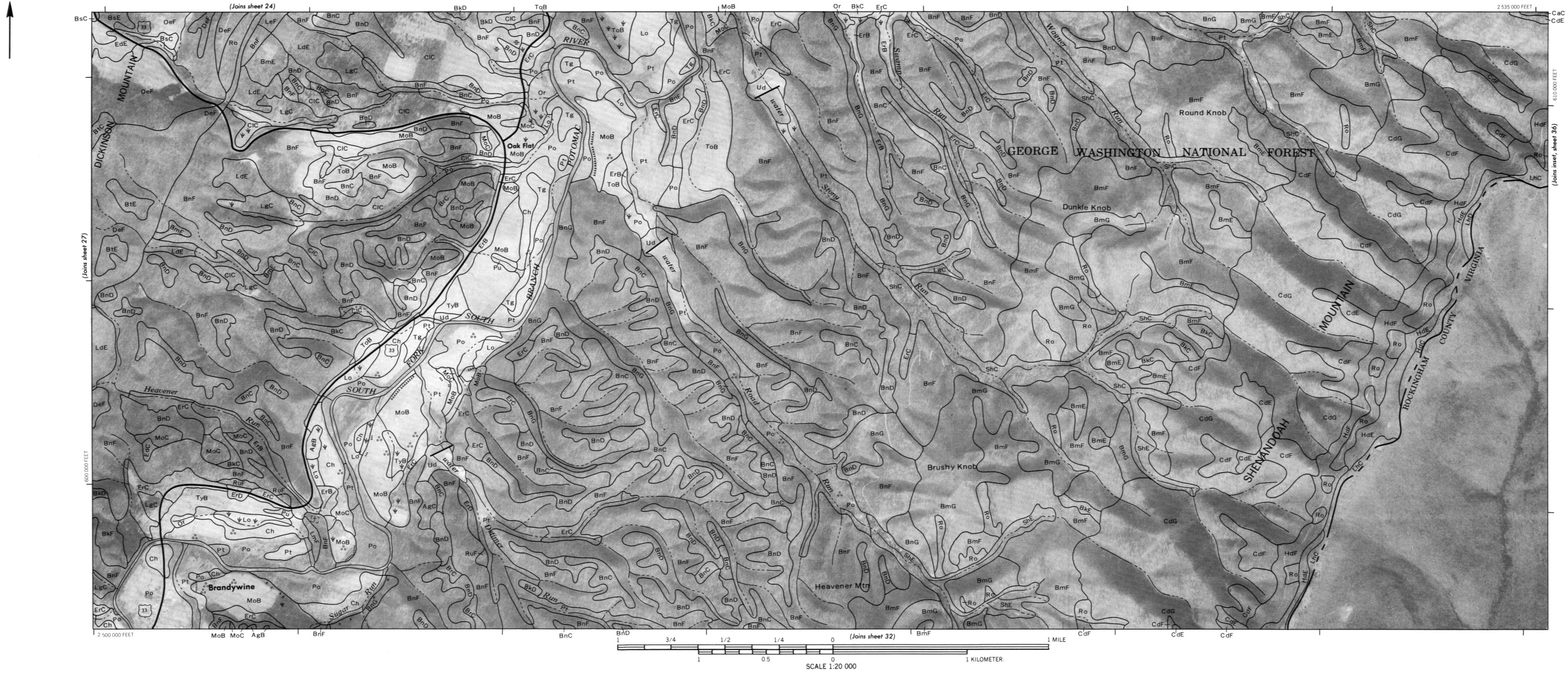


PENDLETON COUNTY, WEST VIRGINIA — SHEET NUMBER 26



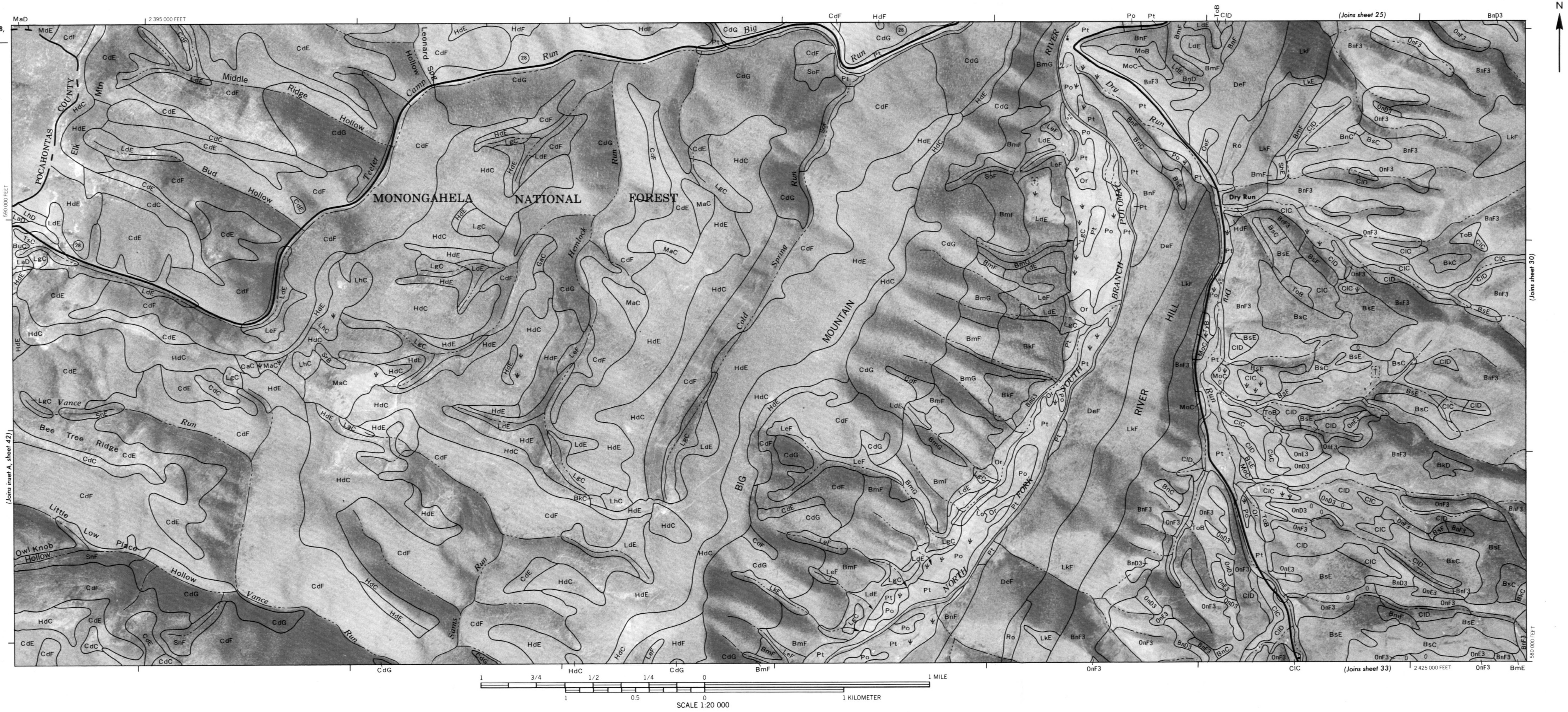
PENDLETON COUNTY, WEST VIRGINIA — SHEET NUMBER 27



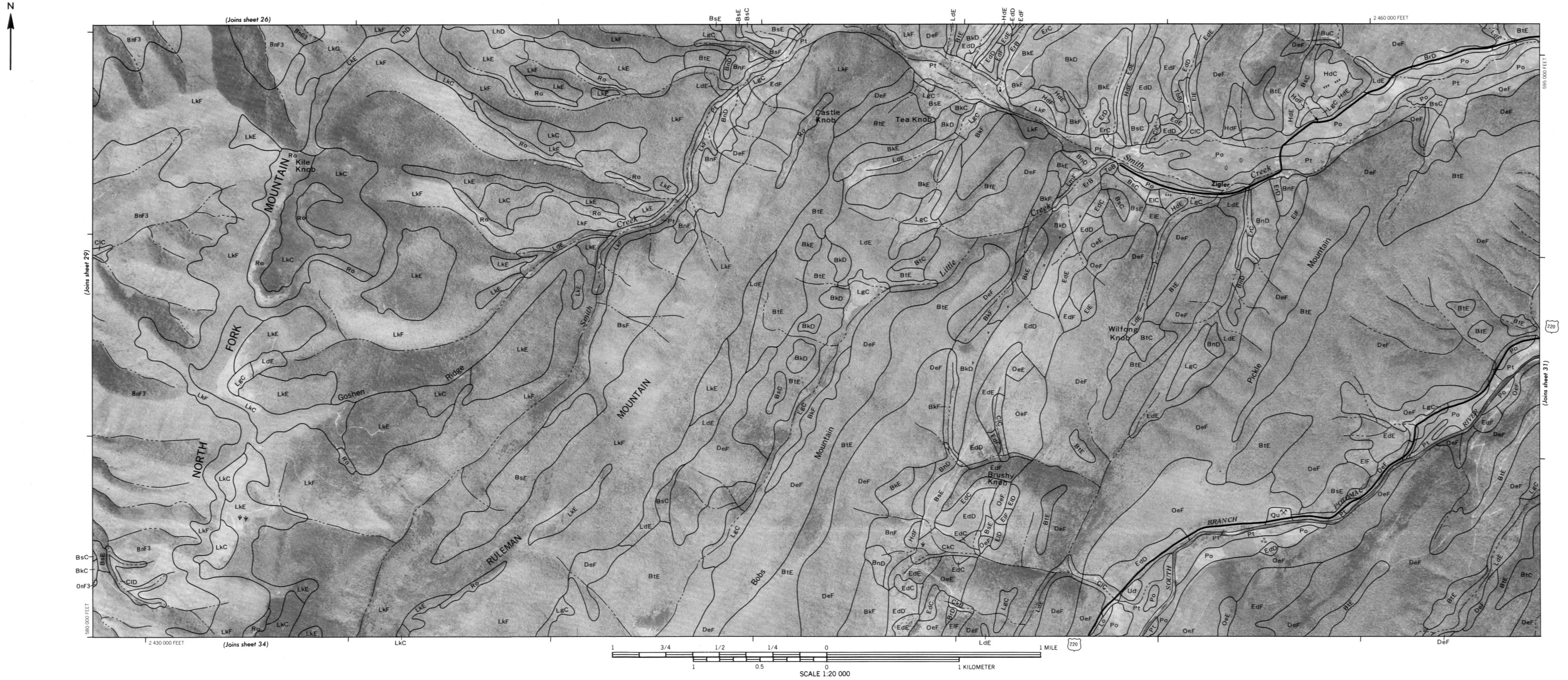

N
(Joins sheet 24)
BsC
BkD
ToB
MoB
Or
BkC
ErC
2 535 000 FEET
CaC
CdE
610 000 FEET
(Joins inset, sheet 36)
(Joins sheet 27)
600 000 FEET
2 500 000 FEET
MoB
MoC
AgB
BnF
BnC
BnD
(Joins sheet 32)
BmF
CdF
CdE
CdF
DICKINSON MOUNTAIN
Oak Flat
SOUTH BRANCH
POTOMAC RIVER
SOUTH FORK
Heavener Run
Brandywine
Sugar Run
Stony Run
Swamp Run
Wagner Run
Road Run
GEORGE WASHINGTON NATIONAL FOREST
Round Knob
Dunkle Knob
Brushy Knob
Heavener Mtn
SHENANDOAH MOUNTAIN
ROCKINGHAM COUNTY
VIRGINIA
water
33
1
3/4
1/2
1/4
0
1 MILE
1
0.5
0
1 KILOMETER
SCALE 1:20 000

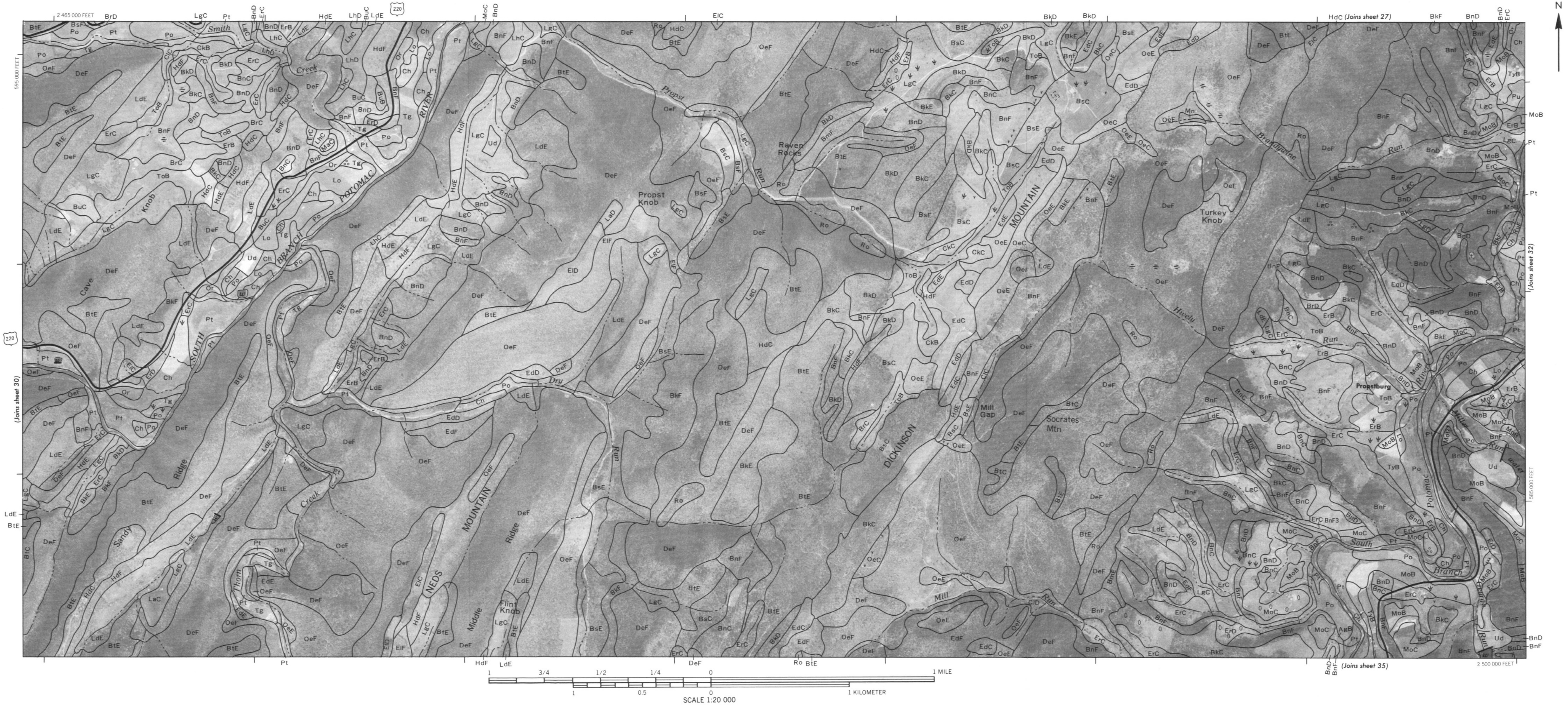
PENDLETON COUNTY, WEST VIRGINIA — SHEET NUMBER 29

㉙



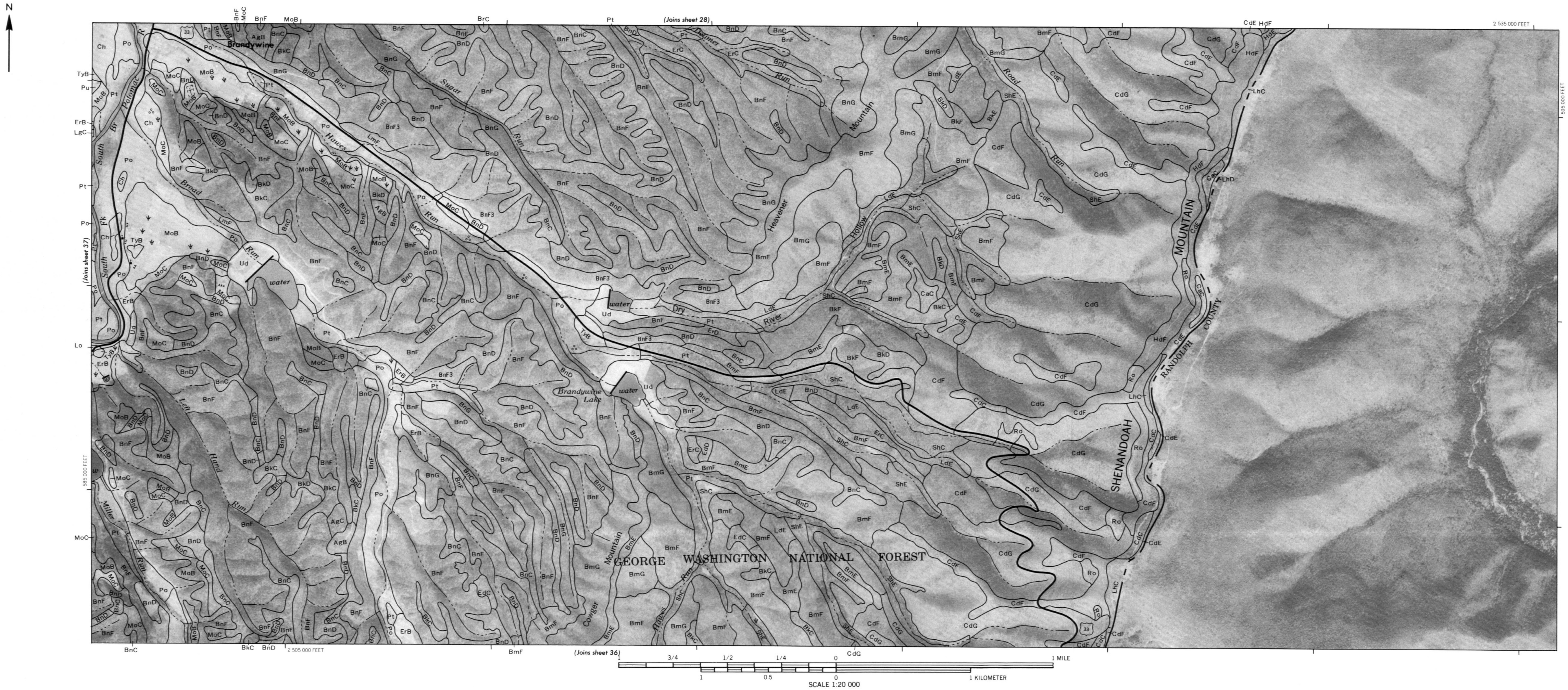
PENDLETON COUNTY, WEST VIRGINIA — SHEET NUMBER 30



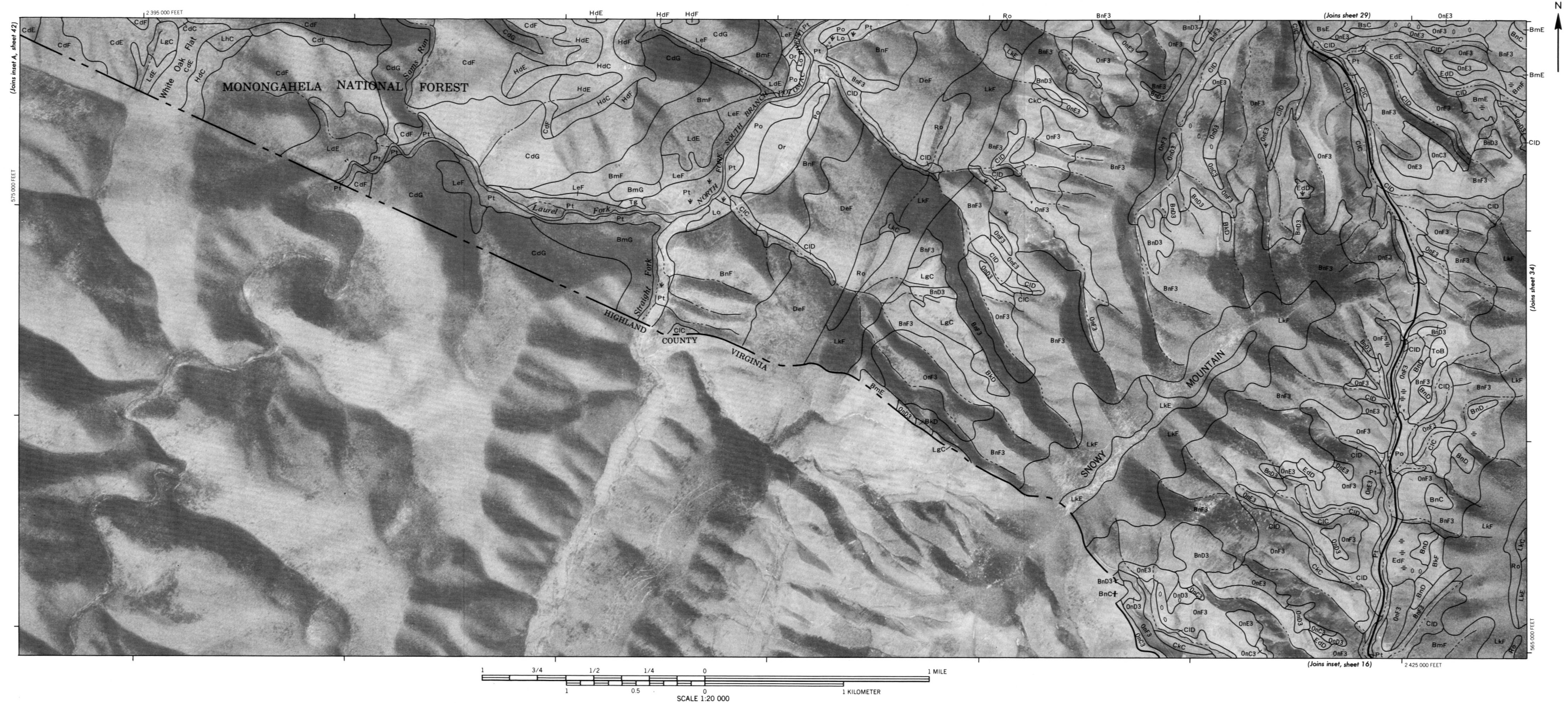

2 465 000 FEET
595 000 FEET
585 000 FEET
2 500 000 FEET
N
220
HdC (Joins sheet 27)
(Joins sheet 32)
(Joins sheet 30)
(Joins sheet 35)
Smith Creek
Knob
Cave
POTOMAC
RIVER
SOUTH BRANCH
Ridge
Sandy
Thorn Creek
Creek
NEDS MOUNTAIN
Middle Mountain Ridge
Flint Knob
Dry Run
Run
Propst Knob
Propst Run
Raven Rocks
DICKINSON MOUNTAIN
Mill Gap
Socrates Mtn
Mill Run
Brandywine Run
Turkey Knob
Hively Run
Propstburg
South Branch
Potomac River
Mill Run
1 MILE
1/4
1/2
3/4
1
0
0.5
1 KILOMETER
SCALE 1:20 000

㉜

PENDLETON COUNTY, WEST VIRGINIA — SHEET NUMBER 32

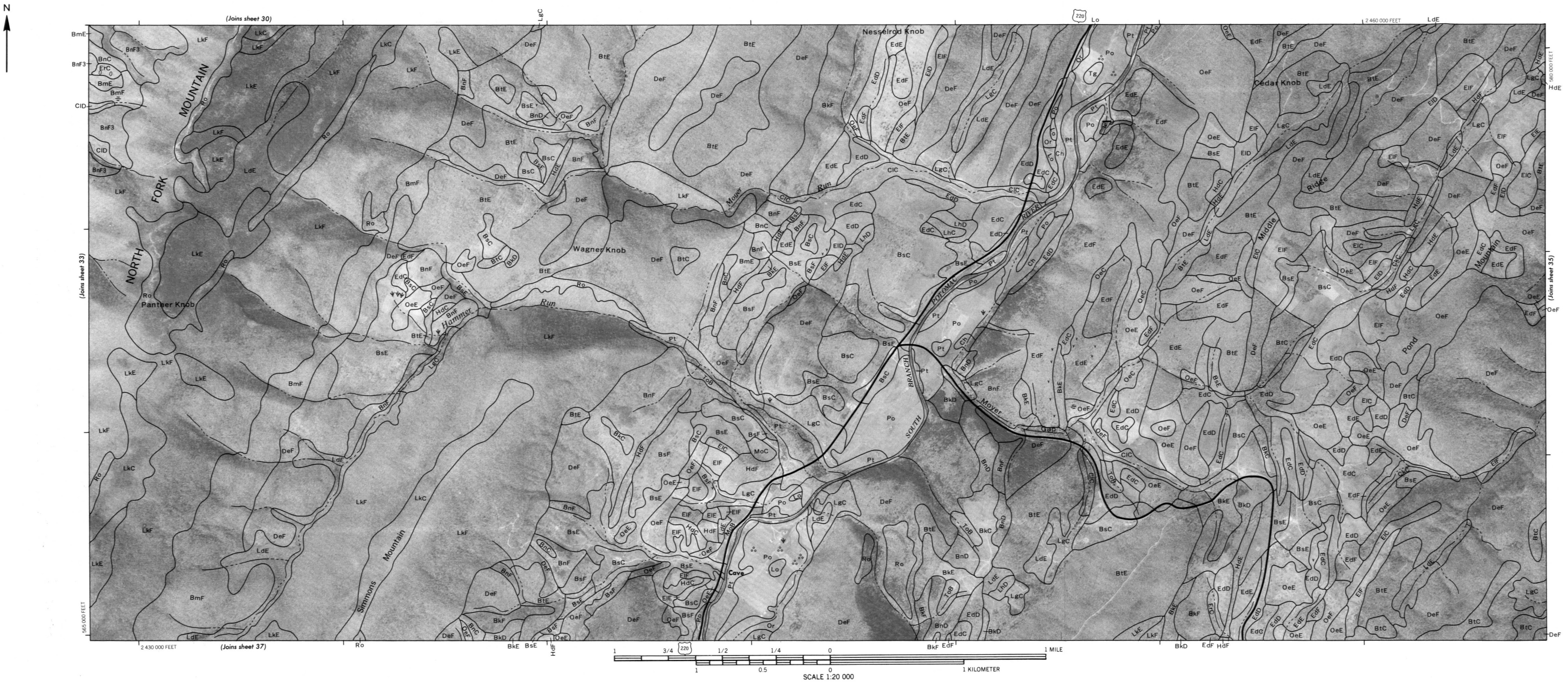


PENDLETON COUNTY, WEST VIRGINIA — SHEET NUMBER 33

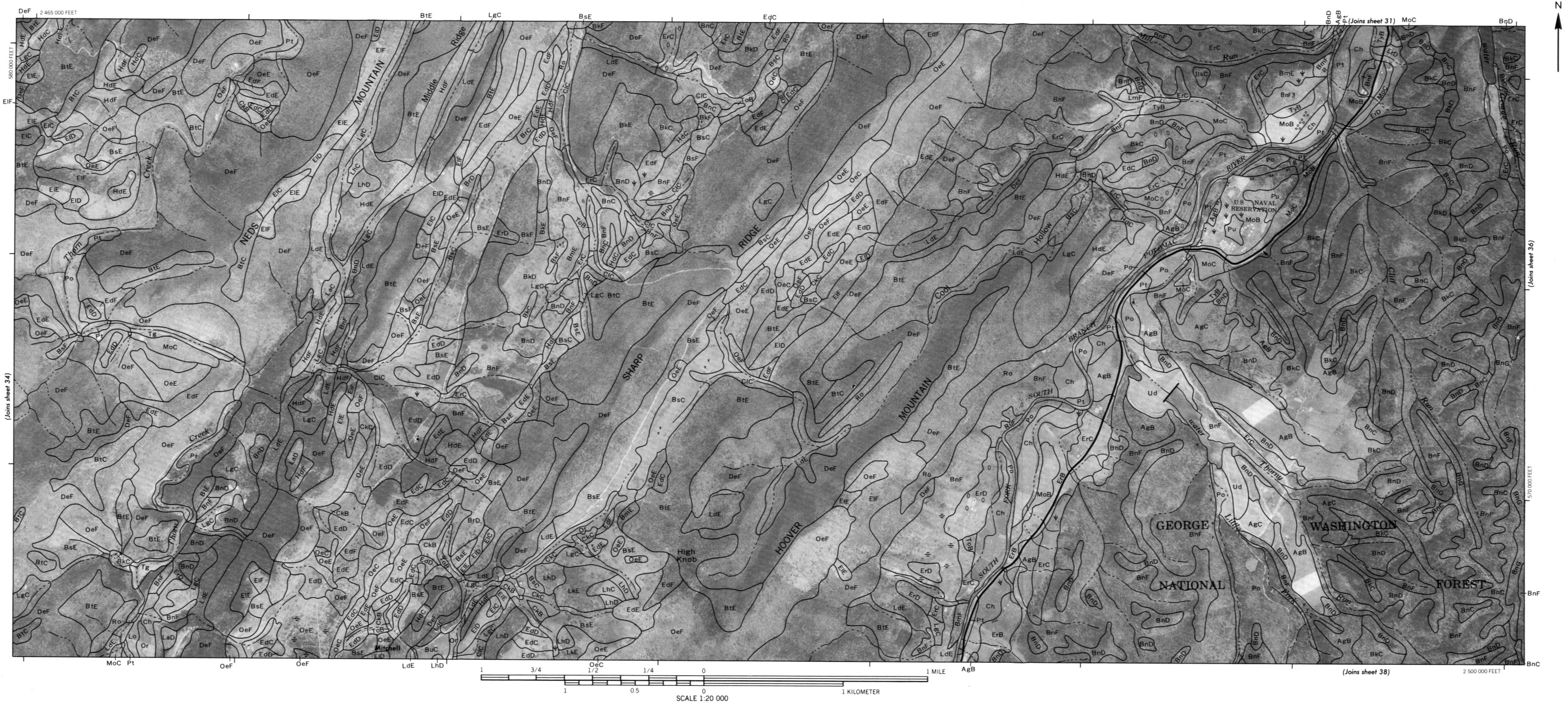


SCALE 1:20 000

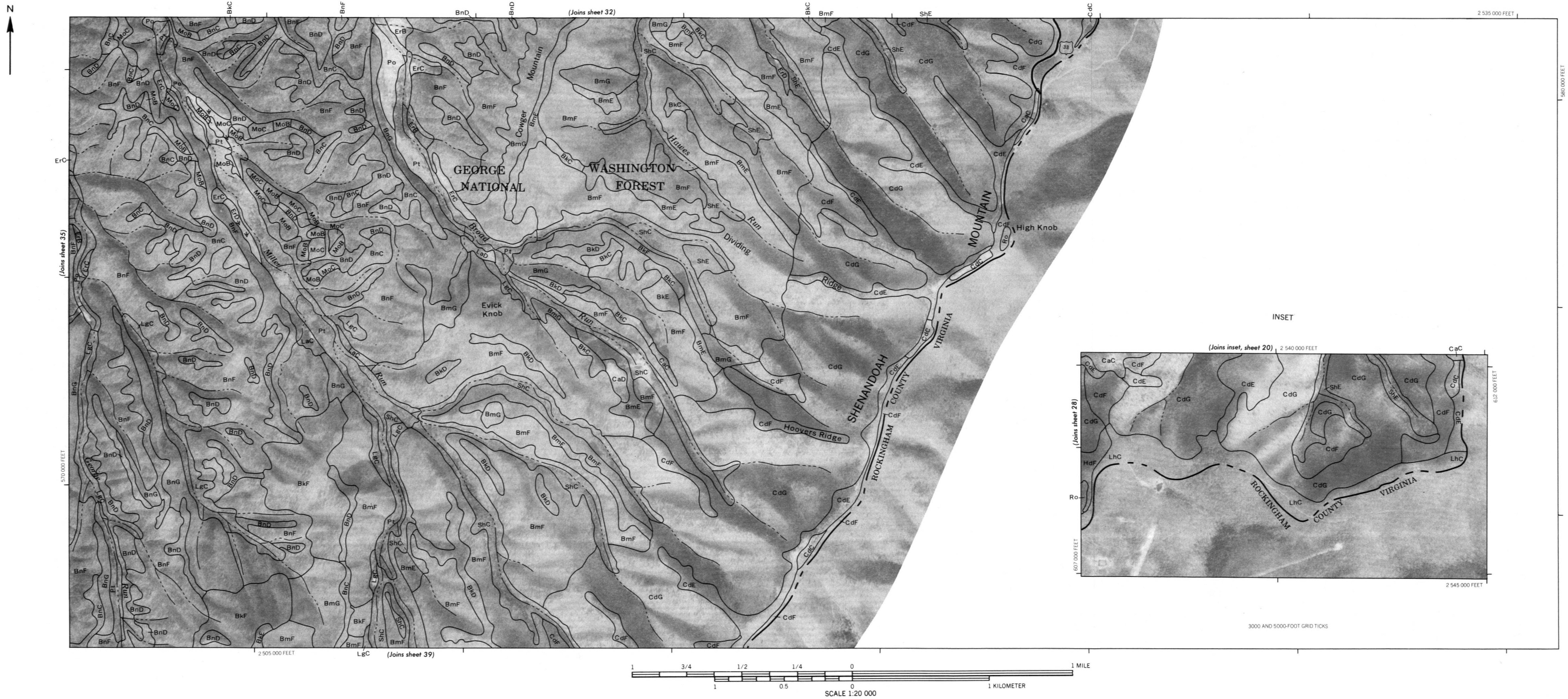
PENDLETON COUNTY, WEST VIRGINIA — SHEET NUMBER 34



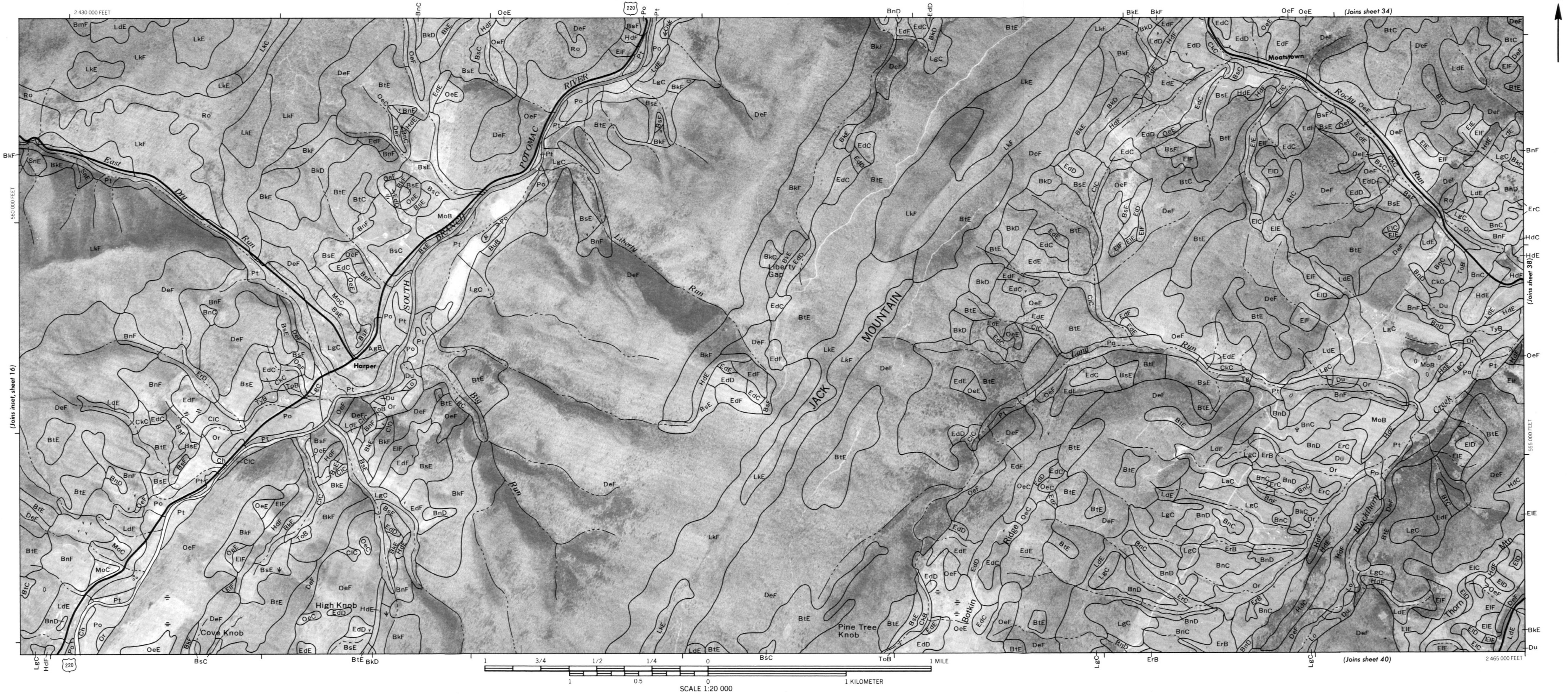
PENDLETON COUNTY, WEST VIRGINIA — SHEET NUMBER 35



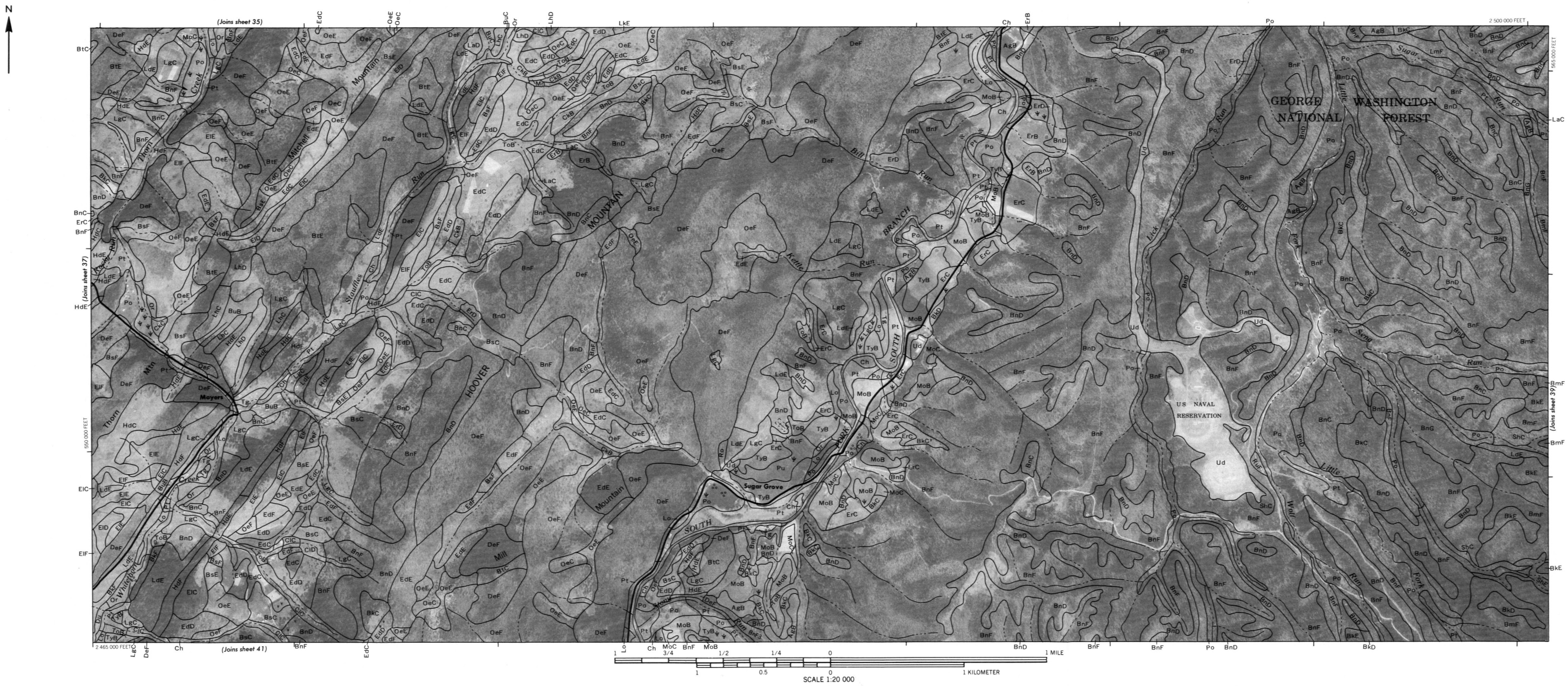
PENDLETON COUNTY, WEST VIRGINIA — SHEET NUMBER 36

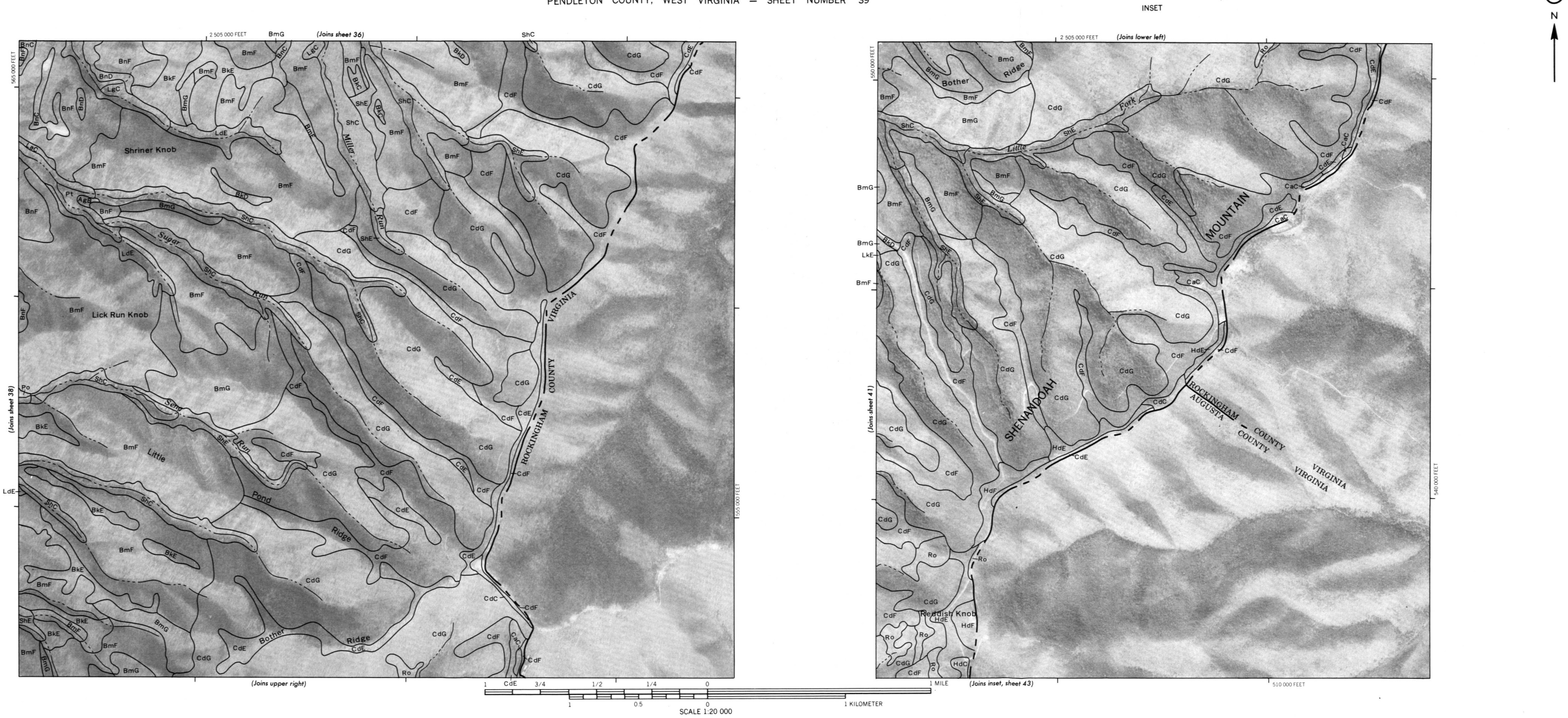


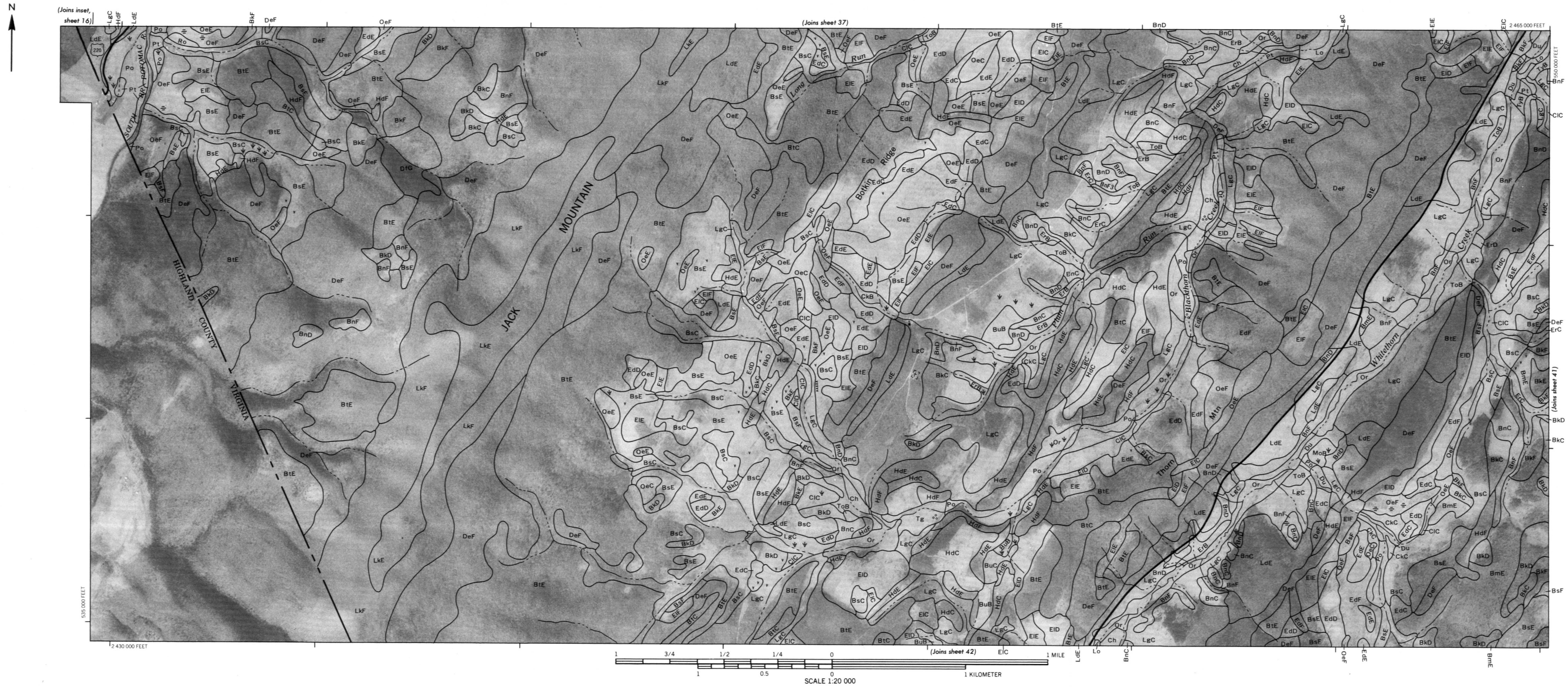
PENDLETON COUNTY, WEST VIRGINIA — SHEET NUMBER 37

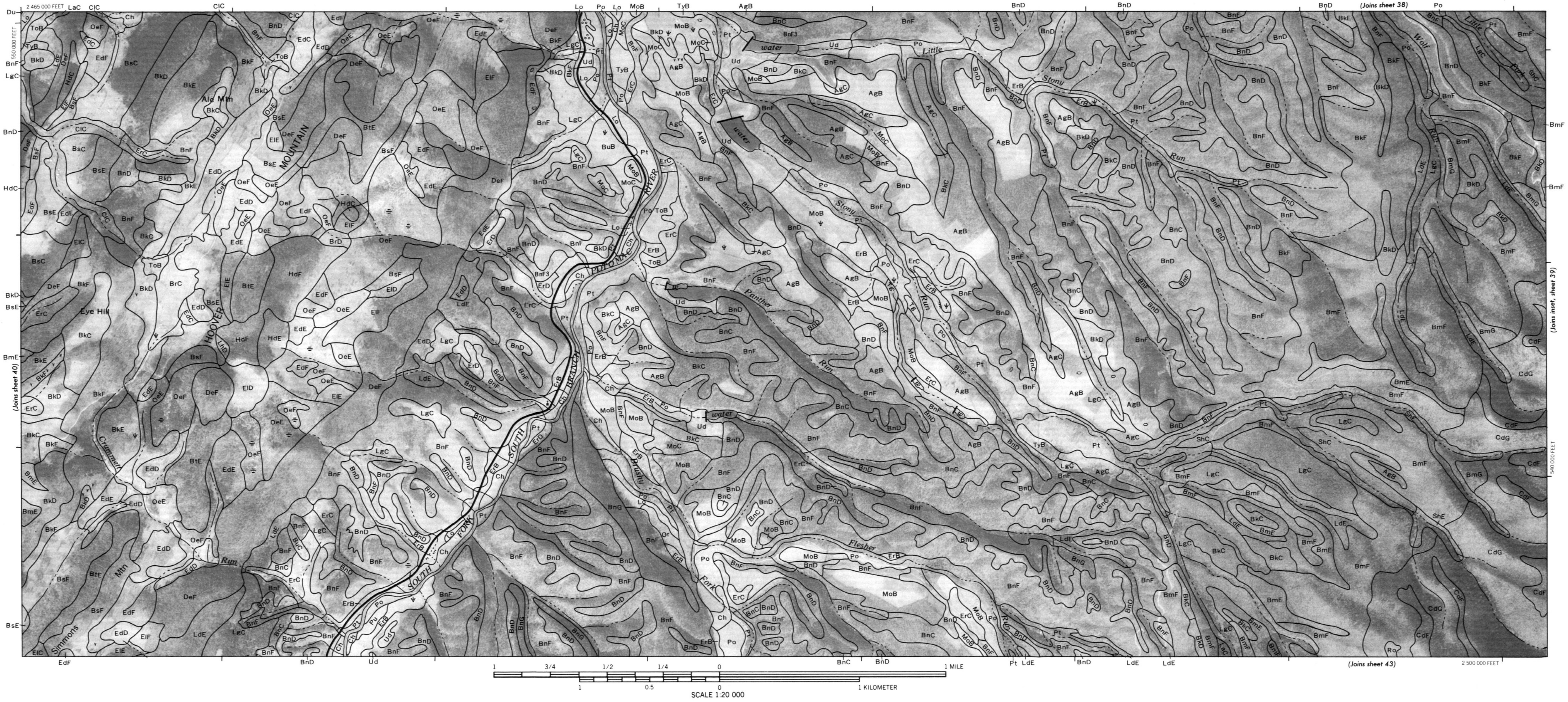


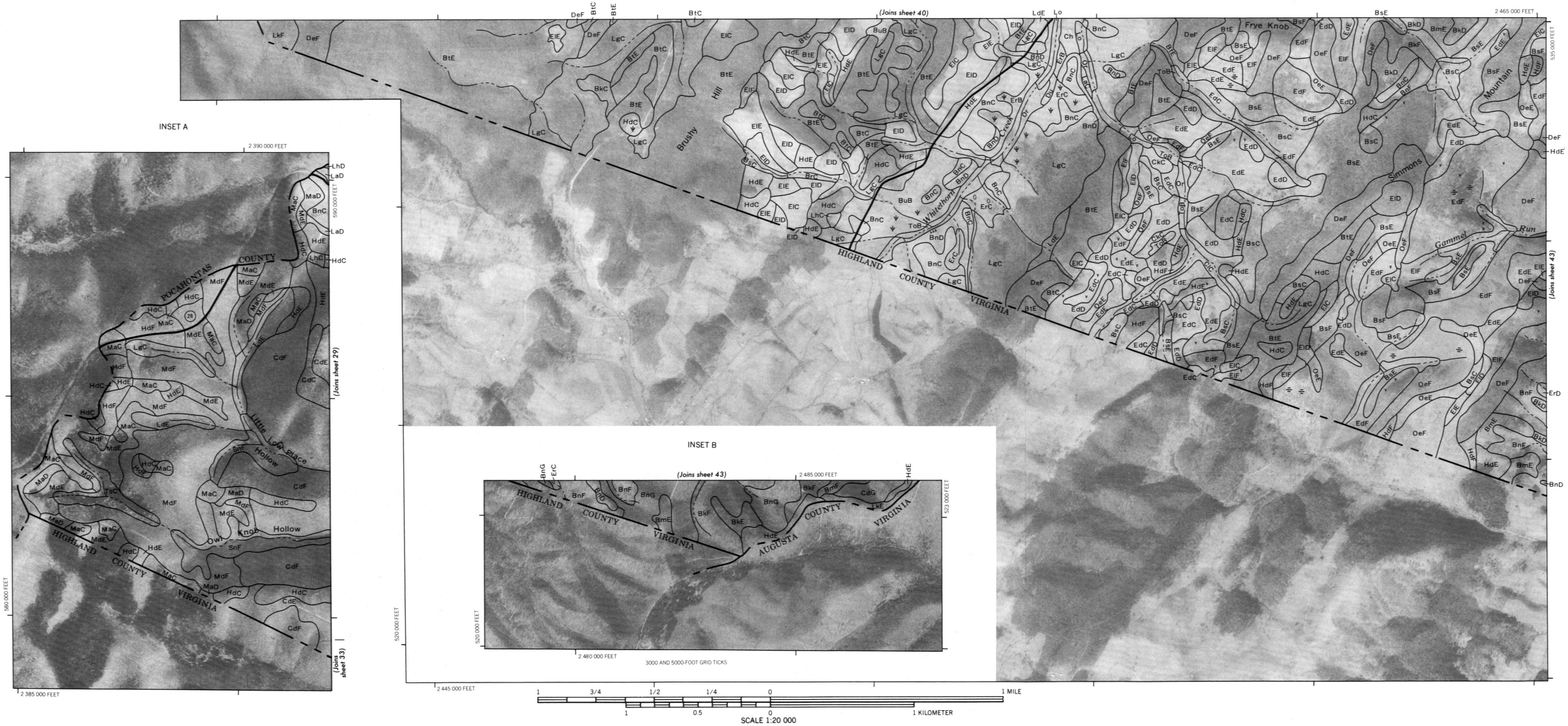
PENDLETON COUNTY, WEST VIRGINIA — SHEET NUMBER 38

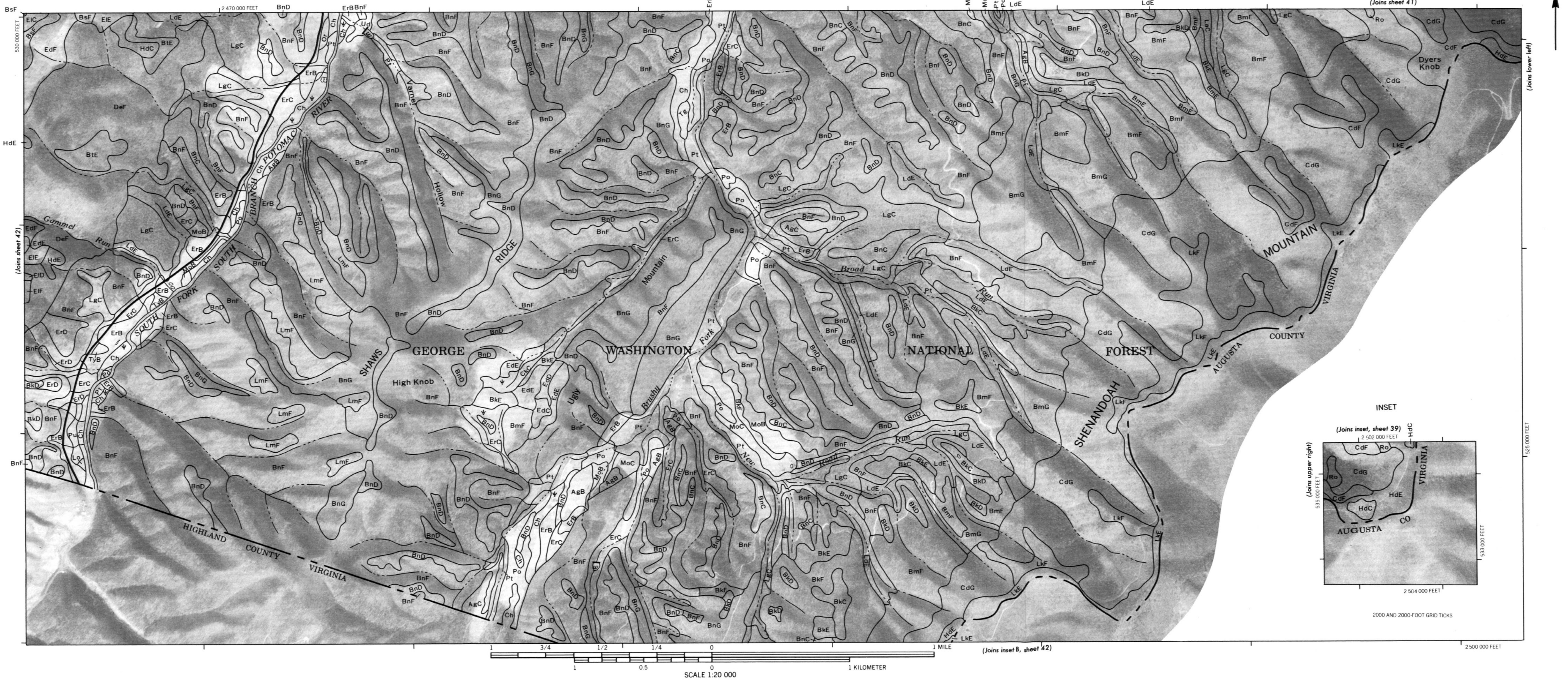



N
INSET
2 505 000 FEET
(Joins sheet 36)
565 000 FEET
(Joins sheet 38)
555 000 FEET
(Joins upper right)
Shriner Knob
Lick Run Knob
Sugar Run
Miller Run
Seng Run
Little Pond Ridge
Bother Ridge
ROCKINGHAM COUNTY VIRGINIA
BmG
ShC
BnC
BnF
BnD
LgC
BkF
BmF
BkE
BkC
BkD
BnE
ShE
CdF
CdG
CdE
CdC
LaC
LdE
Pt
AgB
Po
Ro
CaC
2 505 000 FEET
(Joins lower left)
550 000 FEET
540 000 FEET
510 000 FEET
(Joins sheet 41)
(Joins inset, sheet 43)
Bother Ridge
Little Fork
SHENANDOAH MOUNTAIN
Reddish Knob
ROCKINGHAM COUNTY VIRGINIA
AUGUSTA COUNTY VIRGINIA
LkE
HdE
HdF
HdC
1 MILE
3/4
1/2
1/4
0
1
0.5
1 KILOMETER
SCALE 1:20 000


N
(Joins inset, sheet 16)
(Joins sheet 37)
(Joins sheet 41)
(Joins sheet 42)
2 465 000 FEET
250 000 FEET
535 000 FEET
2 430 000 FEET
SOUTH FORK POTOMAC R.
220
HIGHLAND COUNTY VIRGINIA
JACK MOUNTAIN
Long Run
Botkin Ridge
Plum Run
Blackthorn Creek
Thorn Creek Run
Thorn Mtn
Whitethorn Creek
LdE
LgC
HdF
BkF
DeF
OeF
BtE
BnD
ElE
ElC
BnF
ClC
DeF
ErC
BkD
BkC
BsF
LdE
Lo
BnC
OeF
EdE
BmE
1
3/4
1/2
1/4
0
1 MILE
1
0.5
0
1 KILOMETER
SCALE 1:20 000


N
2 465 000 FEET
550 000 FEET
(Joins sheet 38)
(Joins sheet 40)
(Joins inset, sheet 39)
(Joins sheet 43)
540 000 FEET
2 500 000 FEET
Ale Mtn
MOUNTAIN
HOOVER
Eye Hill
Crummett
Simmons
Mtn
Run
SOUTH
BRANCH
POTOMAC
RIVER
SOUTH FORK
Little Stony Run
Stony Run
Panther Run
Brushy Fork
Flesher Run
Little Wolf Run
water
1 MILE
1 KILOMETER
SCALE 1:20 000


N
(Joins sheet 40)
(Joins sheet 43)
(Joins sheet 29)
(Joins sheet 33)
2 465 000 FEET
535 000 FEET
2 445 000 FEET
INSET A
2 390 000 FEET
590 000 FEET
580 000 FEET
2 385 000 FEET
INSET B
2 485 000 FEET
2 480 000 FEET
523 000 FEET
520 000 FEET
3000 AND 5000-FOOT GRID TICKS
Brushy Hill
Whitethorn Creek
Frye Knob
Simmons Mountain
Gammel Run
HIGHLAND COUNTY VIRGINIA
AUGUSTA COUNTY VIRGINIA
POCAHONTAS COUNTY
Little Low Place Hollow
Owl Knob Hollow
28
1 MILE
3/4
1/2
1/4
0
1 KILOMETER
0.5
SCALE 1:20 000


N
(Joins sheet 41)
(Joins lower left)
(Joins sheet 42)
(Joins inset B, sheet 42)
2 470 000 FEET
530 000 FEET
525 000 FEET
2 500 000 FEET
SOUTH BRANCH POTOMAC RIVER
SOUTH FORK
SOUTH FORK
Gammel Run
Varner Hollow
SHAWS RIDGE
High Knob
GEORGE WASHINGTON NATIONAL FOREST
Mountain
Brushy Fork
Ugly
Broad Run
New Road Run
SHENANDOAH MOUNTAIN
Dyers Knob
HIGHLAND COUNTY VIRGINIA
AUGUSTA COUNTY VIRGINIA
INSET
(Joins inset, sheet 39)
(Joins upper right)
2 502 000 FEET
2 504 000 FEET
535 000 FEET
533 000 FEET
AUGUSTA CO
VIRGINIA
2000 AND 2000-FOOT GRID TICKS
1 3/4 1/2 1/4 0 1 MILE
1 0.5 0 1 KILOMETER
SCALE 1:20 000